DESCRIPTIONS OF SOME OF THE UTENSILS in HUSBANDRY, ROLLING CARRIAGES, CART ROLLERS, And DIVIDED ROLLERS for Land or Gardens, MILLS, WEIGHING ENGINES, &c. &c.

MADE and SOLD

By *JAMES SHARP*,

No 15, LEADENHALL-STREET, LONDON;
Which may be ſeen at his Manufactory, No 133, *Tooley-Street*, SOUTHWARK.

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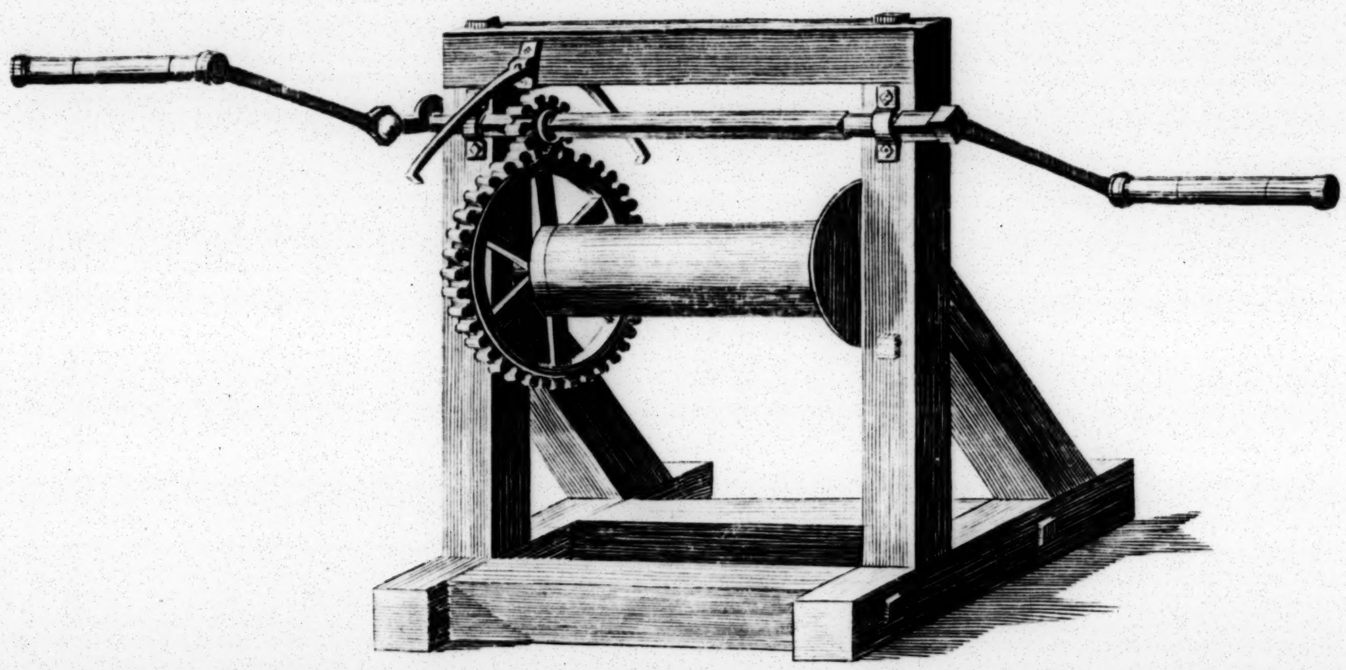
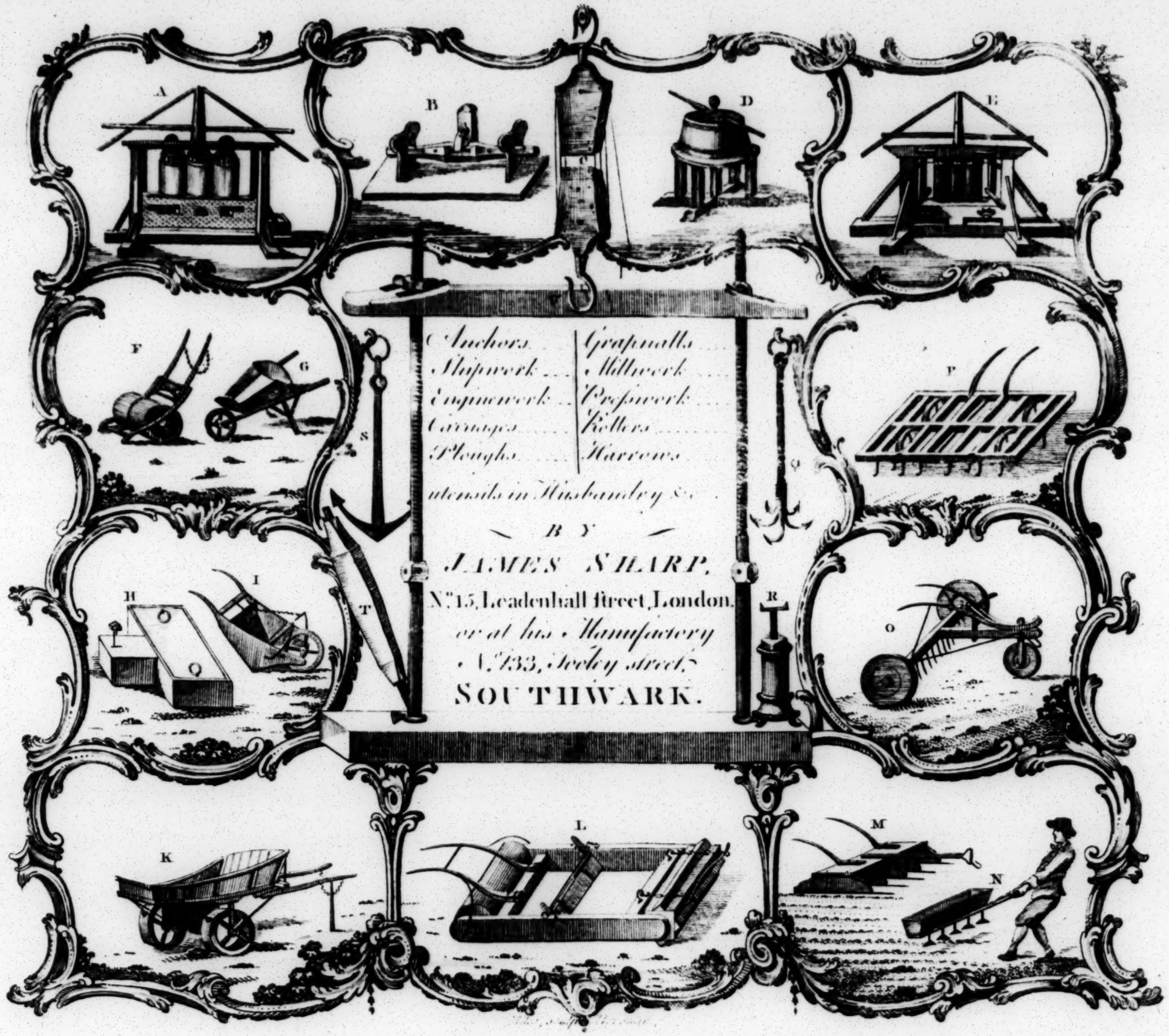


Hand Crane

Miles sculp. Borough

Made & Sold by James Sharp London



Anchors
Shipwork
Enginework
Carriages
Ploughs

Grapnalls
Millwork
Preſswork
Rollers
Harrows

utensils in Husbandry &c.

BY

JAMES SHARP,
No. 15, Leadenhall ſtreet, London.
or at his Manufactory
No. 133, Tooley street,
SOUTHWARK.

EXPLANATION of the Firſt Plate.

A, A Sugar Mill of the common Conſtruction.

B, A Ship's Windlaſs, by Capt. *Wright*, more fully deſcribed in the Liſt of Articles at the End of the Book.

C, Combination Blocks, by Mr. *Smeaton*. The Sheaves of theſe Blocks are in two Tiers; ſo that by a particular manner of reeving the Line, the Fall is brought from the middle Sheave, whereby an even Pull is obtained upon the Block; whereas in Blocks with ſingle Rows of Sheaves, the Line muſt come from one Side only. See the Dictionary of Arts and Sciences, by Hinton.

D, Machine for ſlicing Turnips, by Mr. *Edgehill*. See the Liſt of Articles.

E, Sugar Mill, by Mr. *Woolery*, for which he obtained a Patent, although long and fluted Caſes, which he recommends as the Improvements, have been ſent many Years ago by moſt of the Ironmongers in *London*.

F, A divided Horſe-Roller, with Shafts. See the Liſt of Articles.

G, A Navigation Wheelbarrow, *Brindley*'s Pattern. This is an excellent Improvement upon the common Wheelbarrow, and is now generally uſed in digging Canals. Theſe Barrows are made very ſhort, and the Sides ſloping outwards, ſo that Clay (or any Materials that are liable to adhere to the Barrow) is eaſily diſcharged on either Side, or in Front. The Handles are ſpread wide, ſo that the Load cannot eaſily be top heavy, which is frequently an Inconvenience in common Wheelbarrows; and the Width of the Handles is alſo very convenient in ſhort turning.

H, The Weighing Engine, which is more fully deſcribed in the larger Print.

I, The Horſe-Shovel, deſcribed alſo more fully in the large Print.

K, A Tumbril Cart with broad Wheels, mounted as a rolling Cart, with the Wheels underneath. This Machine is rendered very light by the Lowneſs of the Wheels, which gives it alſo the Advantage of an elevated Draft, whereby it is found that a ſingle Horſe is rendered fully capable of drawing

20 or 30 C. Weight, according as the Road may happen to be better or worſe.

L, A Land Plane, by *Marſhall*, more fully deſcribed in his Treatiſe of Agriculture. The octangular Roller in Front breaks the Clods; the moveable Iron in the middle cuts the Hillocks; and the Roller behind ſmooths both.

M, Drill Plough, by *Ducket*, for Broadcaſt Sowing. See the Liſt of Articles.

N, Man-Hoe, by *Ducket*. Ditto.

O, A Clearing Rake, more fully deſcribed in the Reference to the Jointed Horſe Rake.

P, The Harrow Plough, with Wheels, is a heavy Plough, to be drawn by ſix or eight Horſes. The crooked Teeth are very ſtrong, and bend forwards; and, when drawn by the Horſes, are forced into the Ground, tearing up with them wirey Graſs and every Root, whereby the Land is both cleaned and ploughed at the ſame Time. The Wheels may be ſet higher or lower, which regulates the Depth to which they are wanted to work.

Q. A Ship's Grapnall.

R, A Screw Jack for greaſing loaden Carriages, or for heaving Timber. It is capable of raiſing three or four Tons.

S, An Anchor for an Iron Stock, ſuch as are now uſed in the *Folkſtone* Cutters; the Stocks being made of Iron to be eaſily taken out for the eaſy Stowage on-board, and are now frequently made on this Plan as large as 12 C. Weight.

T, A Side Gudgeon for a Sugar Mill.

V, A Packing Preſs with Iron Screws, for the *Canada* and *North American* Trade, uſed in packing Furs. The Screws of the laſt I made (of which this is the Figure) were eleven Feet long, and 3 Inches Diameter. The Necks are truly turned in a Lathe; the Worms are cut by the Mill, out of the Solid; the Boxes, or Female Screws, are Braſs, and cut alſo out of the Solid; the Boxes are fitted into a caſt Iron Nut, which acts as a Swivel; ſo that though one End of the Cap ſhould be drawn lower than the other, there ſtill will not, in this Caſe, be any Pinch or Binding in the Box or Thread; the Strain upon both being perfectly even and eaſy.

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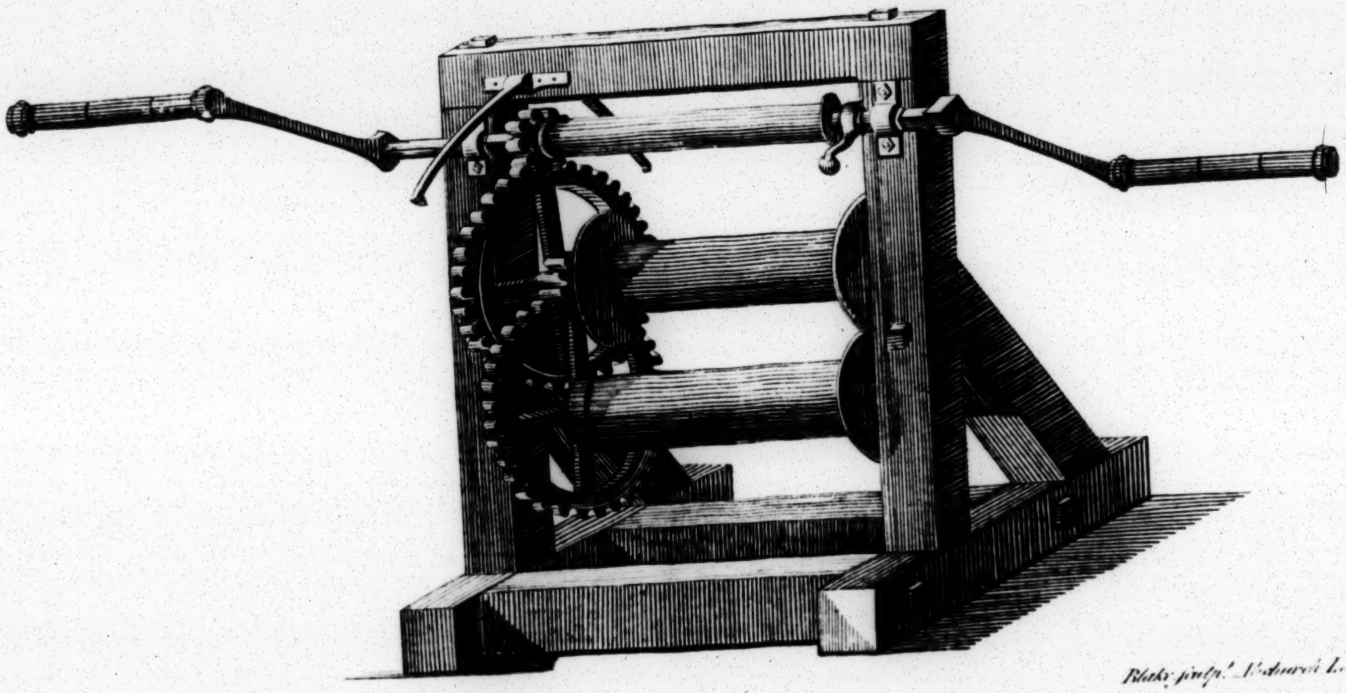


Blake sculp.t Birchin Lane

A DOUBLE HAND CRANE

Made & Sold by James Sharp. London.

DESCRIPTION

OF

HAND CRANES.

(See the Second and Third Plates.)

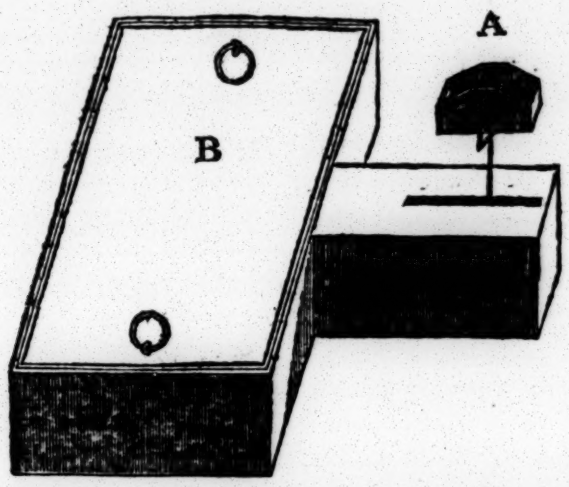
THE Single and Double Hand Cranes, which follow next, may be moſt uſefully applied in almoſt every Situation, as they take up but very little Room, and may be ſcrew-bolted, or laſhed down, to any Warehouſe Floor, or to any Ship's Deck or Maſt, or in Mill-Houſes, or moſt effectually to the Leg of a Triangle, when the Fall muſt be carried over a Snatch-Block, faſtened to the Top of the Triangle.

One Man is able to raiſe, upon the Small Barrel, about 2 C. Weight; upon the Middle Barrel, about 10 C. Weight; but upon the Lower Barrel he will be able to raiſe about 40 C. Weight; and all the Barrels are ſo contrived, that, by ſtriking off the ſmall Pinion, the empty Rope may be lowered a Main, without turning the Handles.

Weighing Engines for Hogſheads, Bales, Cattle, Hay, Straw, or any great Weights, from 14lb. to 3 or 4 Tons,

And ſo ſmall as to be eaſily lifted from one Part of a Yard or Warehouſe, to another;

Very convenient for Planters, Farmers, Wharfingers, Grocers, Carriers Inns, &c. or for Ships Uſe.



THE Engine is contained in a Box of the Shape and Form deſcribed in the Print, which is on a Scale of Half an Inch to a Foot; common Standard Weights are to be uſed, and One Pound in the Bucket at A, will exactly balance 112 Pounds on the Bridge at B; and greater or leſs Weights in Proportion. A rough outſide Caſe is made to receive the Engine, which being let into the Ground, even with the Surface, Hogſheads, or greater Weights, are eaſily roll'd upon it. If Horſes, Oxen, or bulky Things, too large to ſtand upon the Bridge, are to be weigh'd, a Frame is made to lay upon the Bridge, taking Care that the Ends may not touch the Ground, which Frame muſt be balanced by Shot, or ſmall Stones, &c. in the Bucket, and then the neat Weight may be taken by Standard Pounds and Ounces.

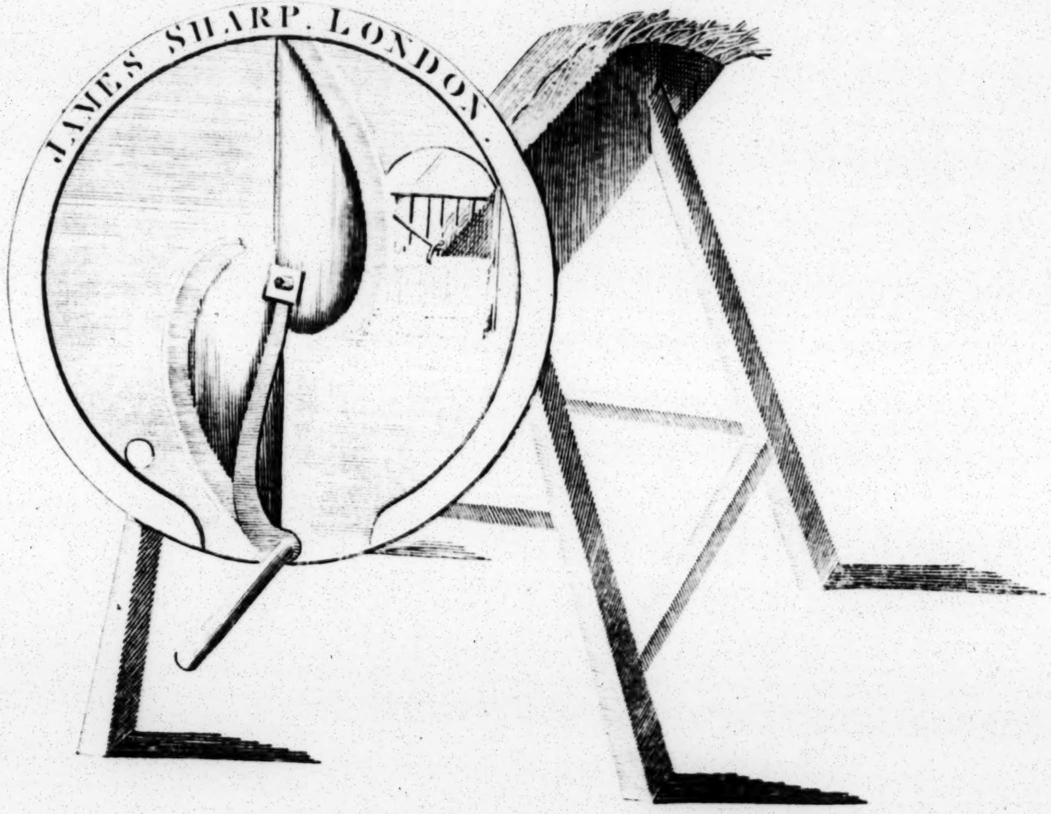
Directions for adjuſting the Portable Weighing Engine.

The Engine is capable of weighing ſo much as Three or Four Tons, and is not liable to be out of Order, though Care ſhould be taken to oil the moving Parts to prevent Friction; and in caſe, by violent Accident, any Thing ſhould be moved from its Place, it may eaſily be proved

proved and adjuſted by the following Rules; If the Bucket A is too heavy, the Bridge at B muſt be lifted out, and the Leaden Weight upon the Long Lever moved as many Notches farther from the Center Pin, as will make the Bridge ſomething heavier than the Bucket (which it always ſhould be) ſo that by dropping a few Grains of Shot into the Bucket, an exact Balance is eaſily made; then, if One Hundred Weight, or 112 ℔ on the Bridge, is exactly balanced by One Pound in the Bucket, it is right ſo far. After this, the Proportion muſt be proved by putting Two, Three, or more Hundred Weights upon the Bridge; which if as many more Pounds in the Bucket do not exactly Balance, then the Proportion is wrong, and muſt be adjuſted in the following Manner: If the Bucket riſes quicker when the Load upon the Bridge is increaſed, then the Bucket Branch muſt be removed further from the Center Pin, taking Care to faſten the Screws firm after any Removal; but if upon increaſe of Hundreds on the Bridge, and an equal increaſe of Pounds in the Bucket, it will not riſe, then the Bucket muſt be moved nearer the Center Pin; but this need never be done, except it has received apparent Injury. After this the Bridge and Bucket muſt again be balanced by the Leaden Weight, and the Engine will be perfect; ſo that

in the Bucket,	will balance on the Bridge,
$\frac{1}{4}$ Oz.	$1\frac{3}{4}$ ℔
$\frac{1}{2}$ —	$3\frac{1}{2}$
1 —	7
2 —	14
$\frac{1}{4}$ ℔	28
$\frac{1}{2}$ —	56
1 —	1 ⊕ Weight, or 112 ℔, *&c. &c.* to any Weight above-mentioned.

N. B. Others are made of a larger Size for Turnpike-Road Engines, ſufficiently portable to be carried in a Waggon to any Part of England, and erected at a ſmaller Expence than any other Kind of Weighing Engine has ever been.


JAMES SHARP. LONDON.

Machine for cutting Chaff or Cane tops for Cattle

Made & Sold by James Sharp London

DIRECTIONS

FOR USING THE

DOUBLE-KNIFE CHAFF-CUTTER.

CARE muſt be taken that the Knives are kept Sharp, by rubbing them on the front Edge with a ſmall Whetſtone, and the Steel at the End of the Box will ſufficiently Whet the Backſide Edge in turning.

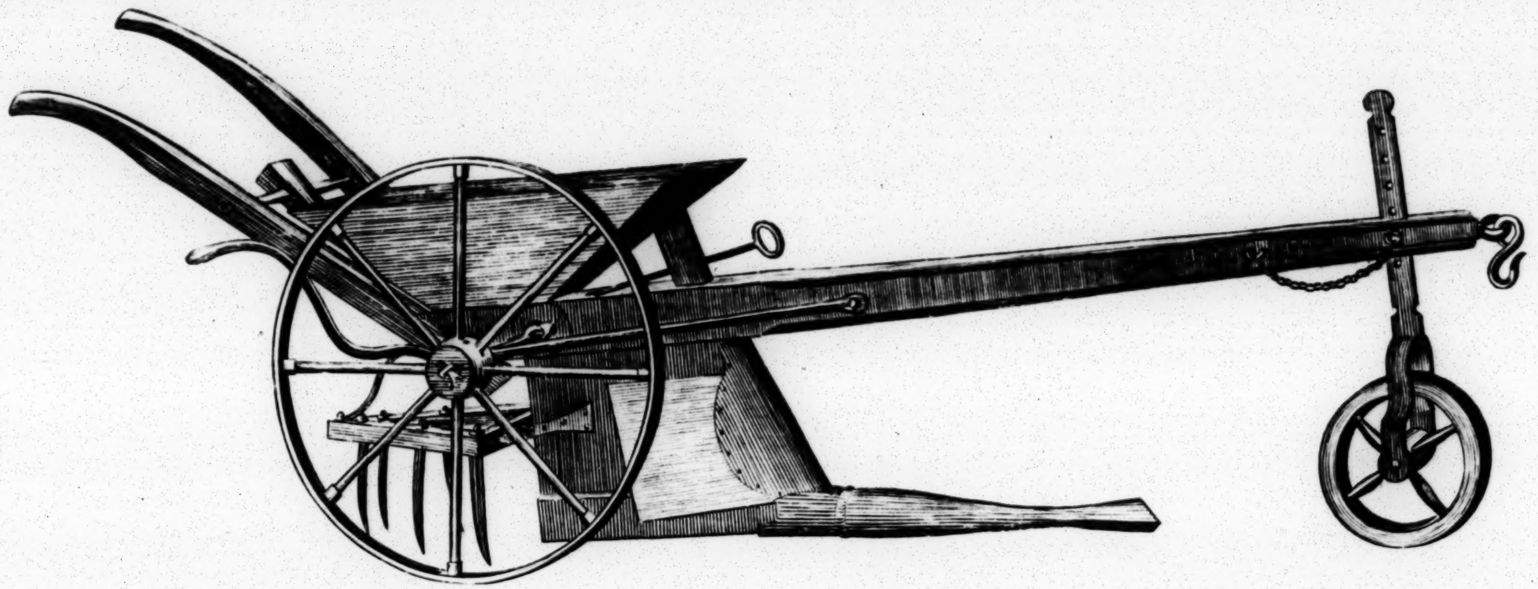
The Hay or Straw muſt be laid long Ways, as in common Chaff-Boxes, but not to exceed the Thickneſs of about two Inches under the Weight.

When the Straw is ſo placed, and the Covering Board laid upon it, the Teeth of the Claw muſt be paſs'd through the Slits of the Covering-Board, as far back as the Forcing Wheel and notch'd Bar will permit.

Work the Engine till the Claw is advanced up to the Weight, and then feed it with more Hay or Straw, by lifting up the Covering-Board, and placing the freſh Straw under what remains, removing back the Claw to its former Situation.

Care muſt be taken that nothing Injurious to the Knife be left among the Straw; and that the Forcing Wheel and notch'd Bar be frequently oil'd.

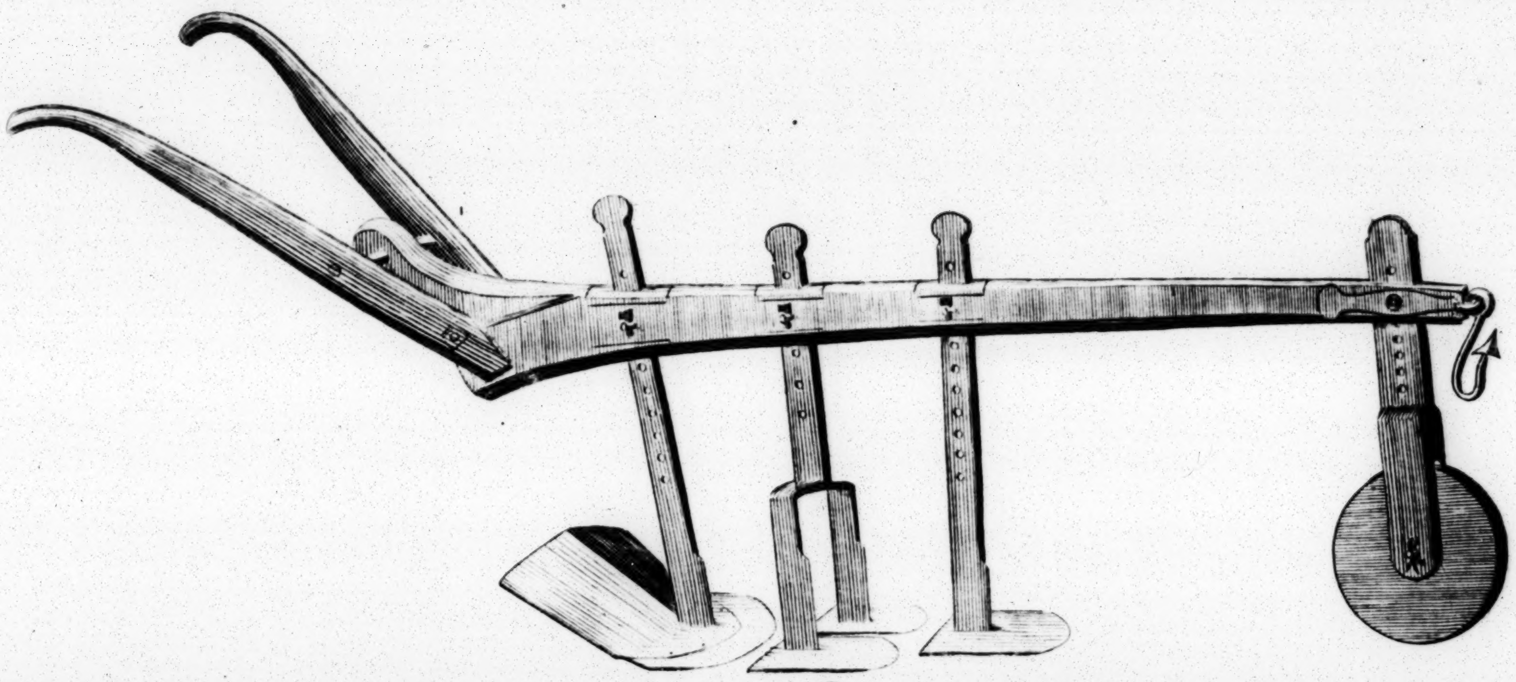
To prevent Injury, it ſhould be kept lock'd, by reverſing the Handle upon the Spindle, a Hole being left in the Wooden Front to receive the Handle, and alſo a Hole in the Spindle to receive a Padlock.



A Drill Plough for single Dropping

Miles sculp. Borough

Made & Sold by James Sharp London



A Horse Hoe for Weeding and Earthing between the Plants in drill Husbandry

Made & Sold by James Sharp Leadenhall Street London

[illegible] sculp. Borough

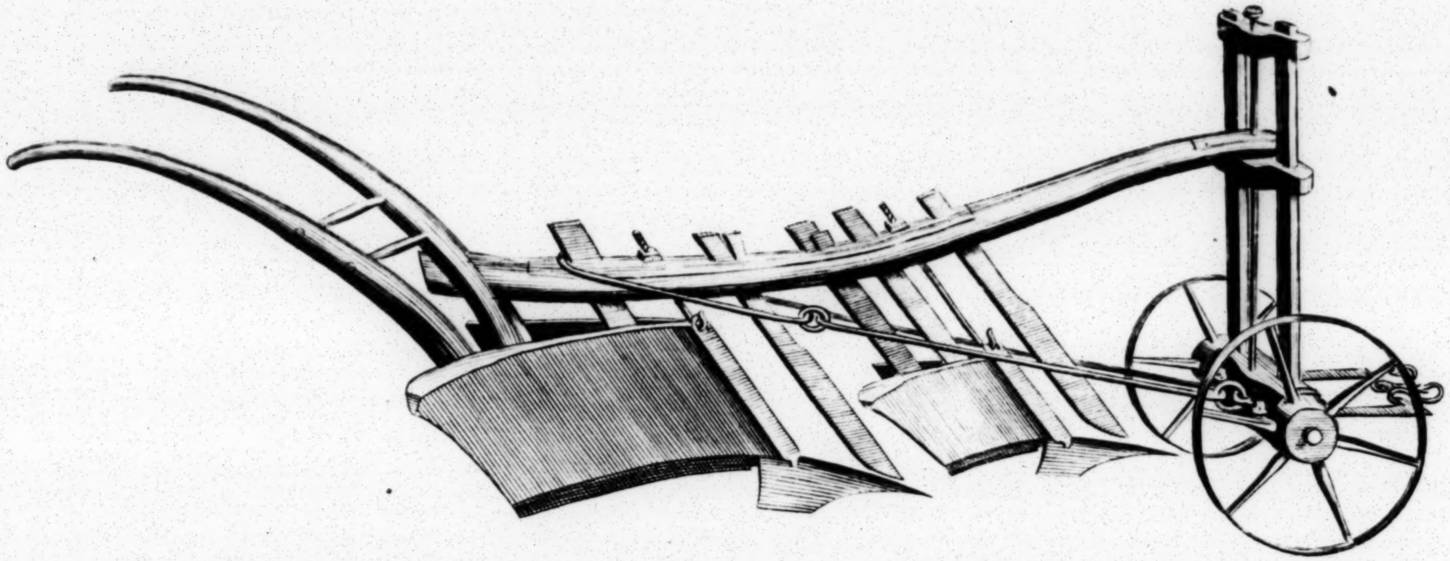
REFERENCE

TO THE

DRILL PLOUGH aud HORSE HOE.

THE Land being firſt prepared to receive the Seed, this Plough is uſed to ſow it in ſtrait Lines, and drop it at equal Diſtances; the Depth of the Furrow is regulated by raiſing the Beam higher or lower upon the Front Wheel; the large Wheel turns a Steel Roller, which is indented with ſmaller or larger Spaces, according to the Size of the Seed to be ſown, and the Diſtance required between each Dropping; and different Rollers (which are eaſily exchanged when neceſſary) are prepared for each ſized Grain; the Screw Handle in Front of the Hopper, prevents a larger Quantity of Seed from paſſing the Roller than is required; by this Means the ſame Frugality is preſerved, whether the Seed be large or ſmall. The large Wheel being lifted up by the ſmall Iron Handle behind, ſtops the Seed when it ought not to fall. In ſome the large Wheel is ſtop'd by a ſmall Hook and Chain, which does as well as the Handle: The Share then forms the Furrow into which the Seed is dropped at any required Diſtance, or Depth, and the Triangular Harrow behind turns the Furrow into a Ridge, the Seed being buried at any Depth that may be neceſſary; and exact Diſtances of the Lines may be preſerved by obſerving the Mark of the large Wheel upon the Ground, over which Mark it muſt be brought again on its return with a new Line.

The Horſe Hoe is an Appendage to the Drill Plough, and the Print explains its Uſe. After the Plants are ſprung up in ſtrait Lines, the Horſe Hoe, with the two foremoſt Coulters, muſt be drawn between each Row (the earthing Shovel, or hindermoſt Coulter being taken out, or raiſed ſo as not to touch the Ground) and the Weeds are left for a few Days to wither, then the hindermoſt Coulter or Shovel is uſed for earthing the Plants, and being raiſed higher or lower, will throw a greater or leſs Quantity of Earth towards the young Plants as the Uſer may think proper. All the Coulters, by wedging, are capable of being directed in ſuch manner as to take more or leſs hold of the Ground, and by raiſing or lowering the Front Wheel any Depths may be taken.



Mr. Ducket's Trenching Plough

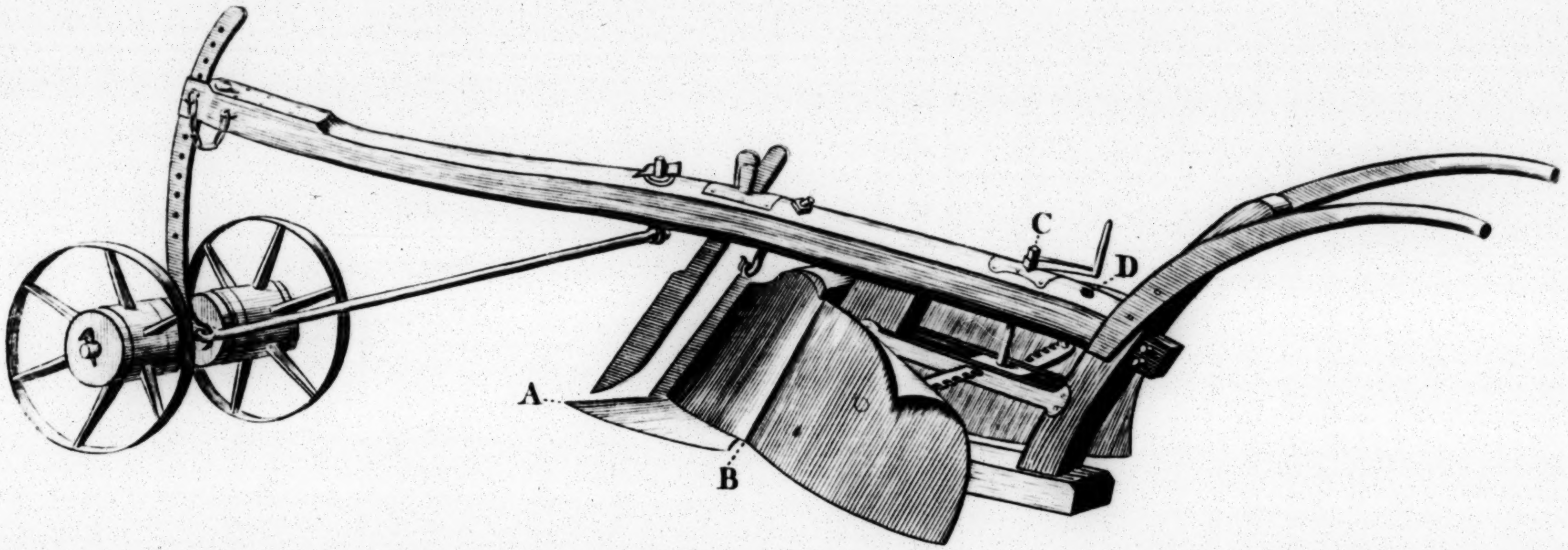
Made & Sold by James Sharp London

Miles sculpt. Borough

Reference to Mr. *Ducket*'s Trenching Plough.

Extracted from the ingenious Mr. *Nathaniel Kent*'s Hints to Gentlemen of Landed Property, Page 88 and 89.

" GROUND will ſometimes be rough ſkinned, and exceeding difficult to be cleaned;
" which, I apprehend, induced ſome ingenious Perſon, a few Years ſince, to
" invent, and conſtruct a Plough, which remedies the Inconvenience at once. This
" Plough has two ſeperate Shares, and Coulters; but both are contrived to operate in
" the ſame Line, or Direction. They are each of them ſet to any Depth, and lay the
" Ground the ſame Way. The firſt pares off the Turf, or Skin; the next ploughs up
" a clean Body of Earth, and throws it directly over the former, ſo as to bury it effec-
" tually. By which ſimple Means, the Land is at once effectually cleaned. Whatever
" further working the Ground may require, it may be done by ſhallower ploughing.
" to which particular Crops may be ſuited. And there is no Neceſſity for bringing the
" rough or foul Part up again, till it be entirely rotton. Sometimes two Crops may
" firſt be taken. This Method is practiſed much among the Gardeners and Farmers
" in the Neighbourhood of *London*; and might be every where adopted, except where
" the Land is ſtony, or remarkably ſhallow. Nor is this Plough at all difficult to
" manage, or much harder to draw than one of an ordinary Conſtruction. The In-
" ventor, whoever he was, may juſtly pride himſelf upon his Diſcovery.



Mr. Arbuthnots draining Plough, improved by Rack & Pinion.
to work at any Width.

Made & Sold by James Sharp London

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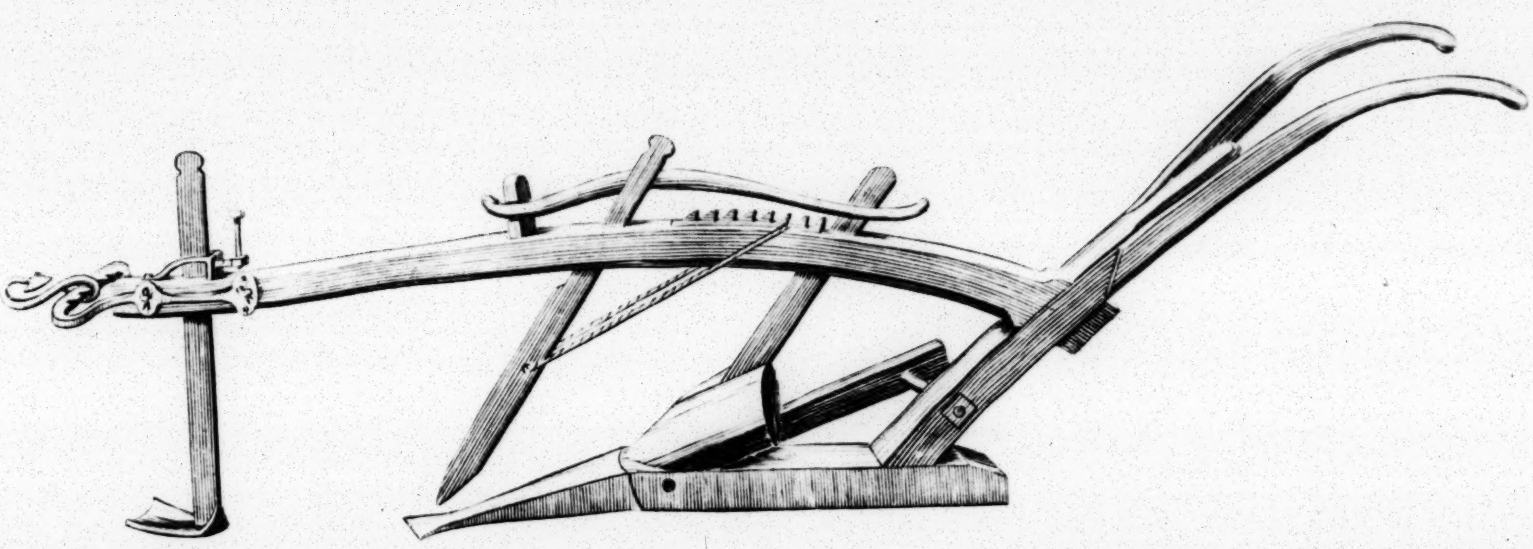
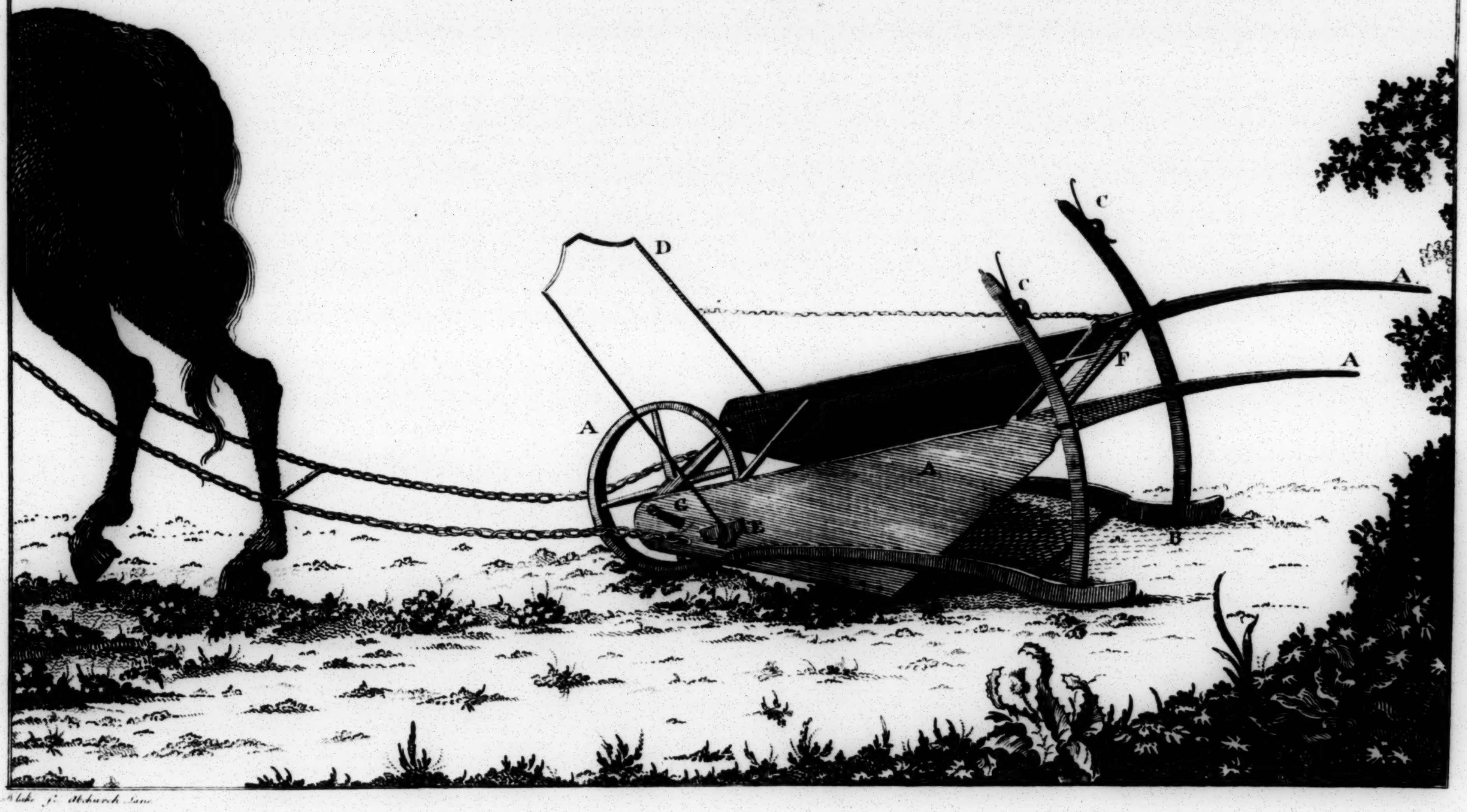


A Turn Wrest or Kentish Plow

Made & Sold by James Sharp London

Miles ſculp. Borough

The Suſsex Horse Shovel improved for various purposes
by James Sharp.



Blake sc. Abchurch Lane

REFERENCE to the HORSE-SHOVEL.

THE Horſe-Shovel is a moſt expeditious Machine for removing Earth, or Soil, of any Kind, ſhort Diſtances, by Horſes inſtead of Wheelbarrows or three-wheel Carts, and without the Trouble of loading or unloading, or even ſtopping for either Purpoſe; for, as the Horſes proceed, it loads itſelf; and, when arrived at its Deſtination, it unloads, returns again and loads, the Horſes continually moving forwards, ſo that its Execution in the Diſpatch of Work is almoſt incredible.

It is particularly uſeful in Road-making, where the Top of a Hill is to be cut through to fill up the the lower Ground or Valley.

If the Ground is hard or ſtony, it muſt be ploughed, and the Plough kept going as the Shovel takes it off.

This is alſo an expeditious Machine for cleaning Ponds, and, if it is not very deep, may be done without draining out the Water.

The Form and Parts of the Horſe Shovel deſcribed.

THE Body, A, is ſtrongly ſhod with Iron, and, when drawn forward, cuts the Ground, (if not too hard,) when the Earth will riſe up to make a full Heap above the Brims.

The Wheel (A) prevents it from dipping too deep, and carries the Front when empty.

The Sledge (B), except when it is required to deliver in ſmall Heaps, is always upon the Ground.

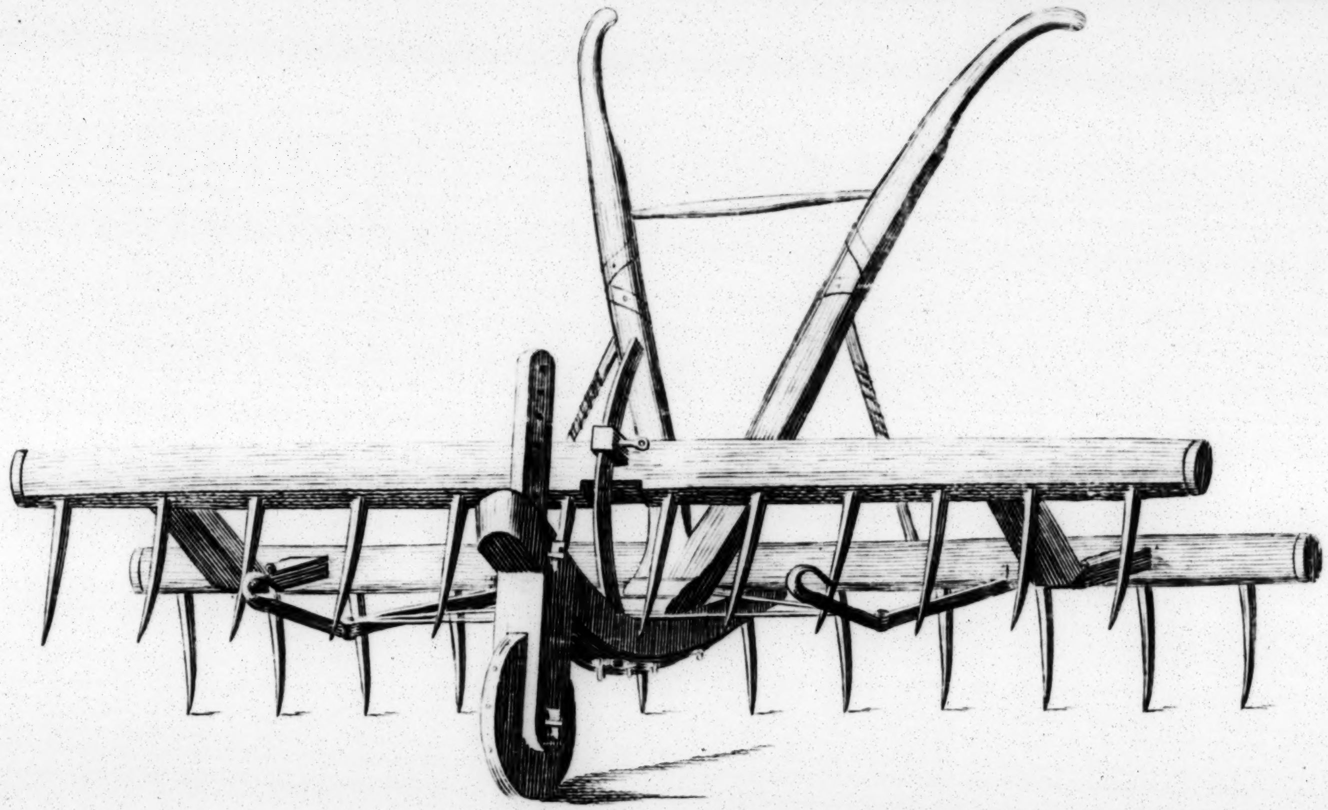
When it is to load, the Handles (A) muſt be preſſed down; when it is full, they muſt be let go: ——When it is lifted up to the Catches (C) it will deliver its Load, and hang there without any holding, till it is returned to load again, when, by raiſing the Handles to touch the Hooks, it will drop down again, and begin to load.

When it is required to unload in ſmall Heaps, the Iron Caſt-off (D) is confined down at F, and the Horſes faſtened at the crooked End E.——When the Caſt-off, D, is looſened from F, it will fly forward, and the Trace-Chain will quit the Hook, as appears by the Print; and the Horſes are inſtantly diſcharged.——The Bolts at F being ſhot into the Standards B C, and the Shovel drawn backwards by the Man, the Wheel will riſe, and the Load will be dropped in a ſingle Heap.

The Model of this Machine was given to me by the late *Roſe Fuller*, Eſq. of the County of *Suſſex*, a Member in the late Parliament.

The Parts in the Print, marked A, ſhew the Form of the Shovel, exactly as it was given to me; having the Appearance of a large Wheel-barrow without a Bottom. Even in this Form it was an uſeful Machine, but the lifting it up to clear the Load, and the bearing it from the Ground when empty, was very hard Work to the Holder.

To remedy this Defect, I added the Wooden Sliders (B) and the Iron Caſt-off (D), which completed the Machine.



A jointed Horse Rake for Couch Grass or Stubble

Made & Sold by James Sharp London

Wiles sculp.t Borough

Reference to the Jointed Horſe Rake.

THE Wheel in Front prevents the Teeth from dipping too deep into the Ground, upon any ſudden Obſtruction; by Means of the Sweep Bar, the Front Rake is raiſed higher or lower, made uſe of or not, as Occaſion requires.

For Couch Harrowing, the Front Rake ſhould be drop'd down, that the Points of the Teeth may be level with the Teeth of the Hind Rake; and the Teeth of one Rake being oppoſite the Spaces of the other, the Roots of the Couch Graſs cannot eaſily eſcape.

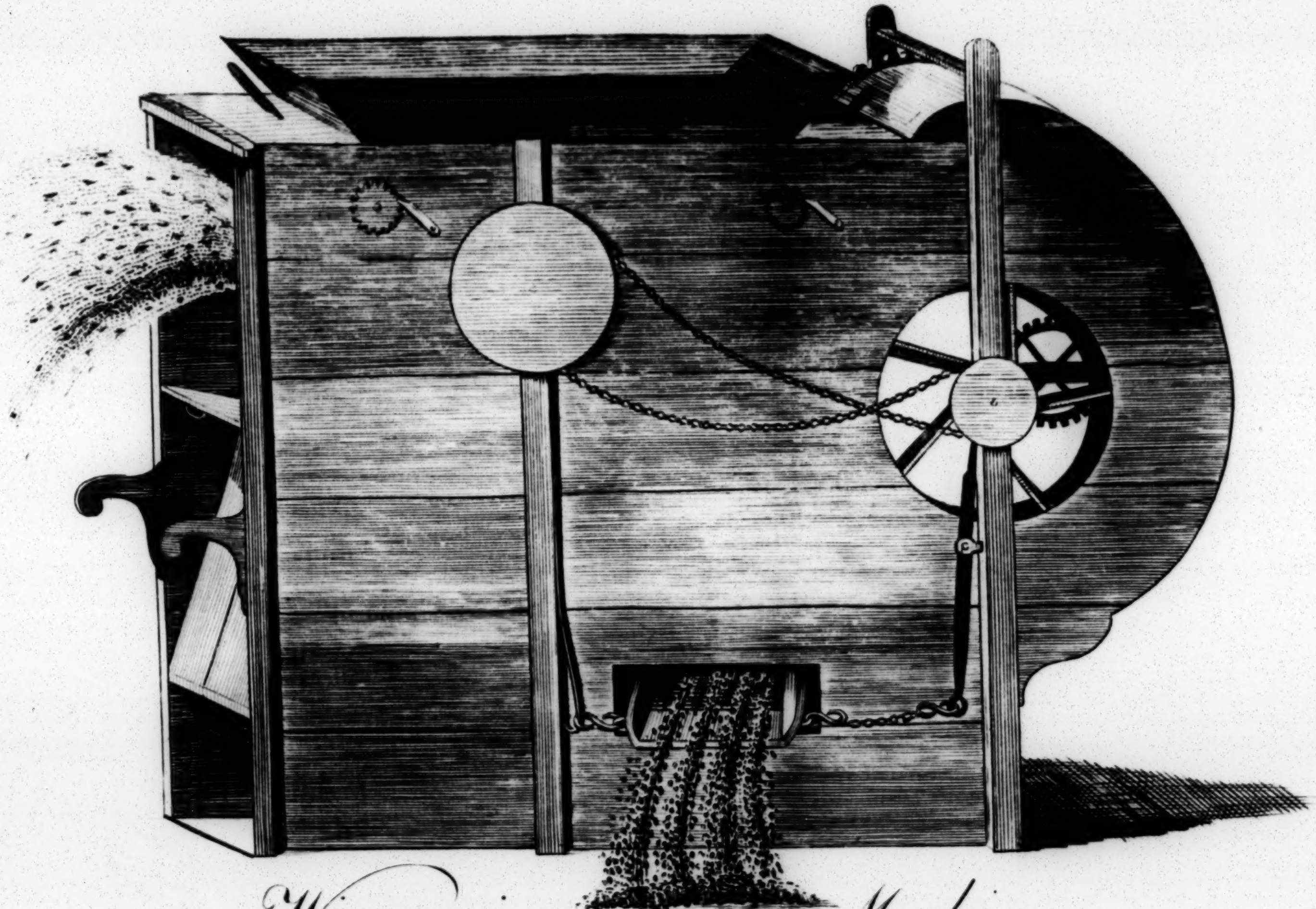
When it is uſed for gathering Stubble, Graſs, &c. into Heaps, the Front Rake ſhould be thrown up, and fix'd by the Pin in the Sweep Bar; and when a ſufficient Heap is collected before the Hind Rake, it muſt be lifted up by the Handles, and the Heap will remain ready for burning, of carrying away, as may be neceſſary.

Others are made with a Wheel at each End of the Hind Bar, for the Purpoſe of Hay-raking, or collecting Leaves or Twigs from Gravel or Graſs Walks, at the latter End of the Year; the Rake-Teeth being ſet as near the Ground (but not to touch) as rhe Uſer pleaſes; this is a very expeditious Method of cleaning Lawns or Bowling-Greens, but for the latter Purpoſes, the Strength of a Man is ſufficient to draw or puſh it.

Another Kind of Rakes, agreeable to the latter Deſcription, have an horizontal Bar between the Hind Wheels, with as many Holes as Teeth in the Hind Bar, through which Holes the Teeth are paſſed; ſo that by lifting up the Handles behind, the Teeth are drawn up into the Holes, ſo far as effectually to be diſcharged from every Accumulation, be it ever ſo ſticky. — Theſe are called *Clearing Rakes*, being only intended for clearing or raking the Surface of the Ground, and not for Couch Harrowing.

JAMES SHARP.

Nov. 20, 1777.



Winnowing Machine

Made & Sold by James Sharp London

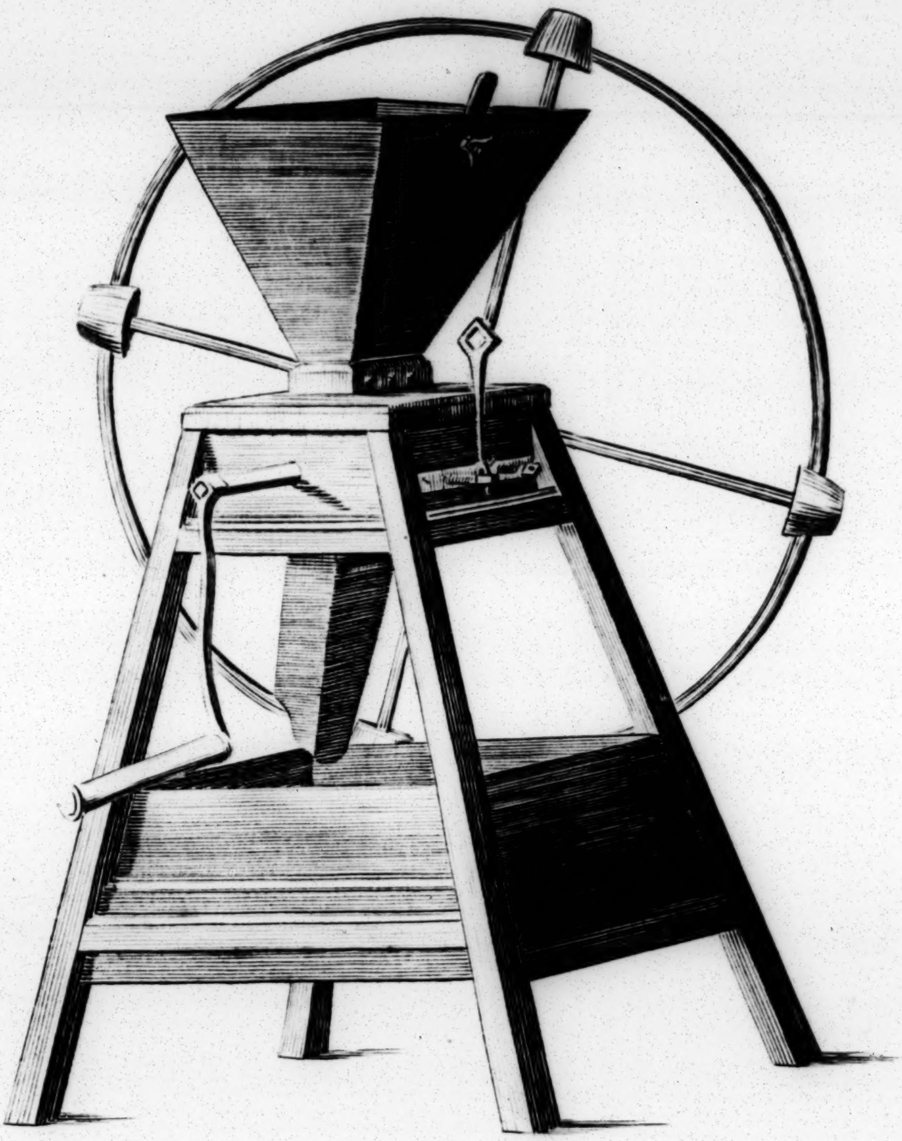
REFERENCE
TO THE
WINNOWING MACHINE.

THE Pattern for this Machine I had from the ingenious Mr. *Ducket of Peterſham*, being one that was given to him by his Grace the Duke of *Buccleugh*——It was much recommended by Mr. *Ducket*, as an uſeful Machine, being an Improvement upon that preſented to the Society of Arts by Mr. *Evers*, in *January*, 1761, an accurate Engraving of which may be ſeen in Mr. *William Bailey's* Deſcription of uſeful Machines and Models, Plate No. XX, Page 90.

Since it came into my Hands, ſome uſeful Alterations have been made, which render it more ſimple, and, perhaps as compleat as it is capable of being made.

The Wheat and Chaff being thrown into the Hopper, and the Machine put in motion, it effectually ſeparates the Corn from every other Mixture; the Chaff and Duſt is blown out at the End, the Ears of Corn, Sticks or Stones are ſeparated into different Drawers, and the clean Wheat comes out at the Screen in Front.

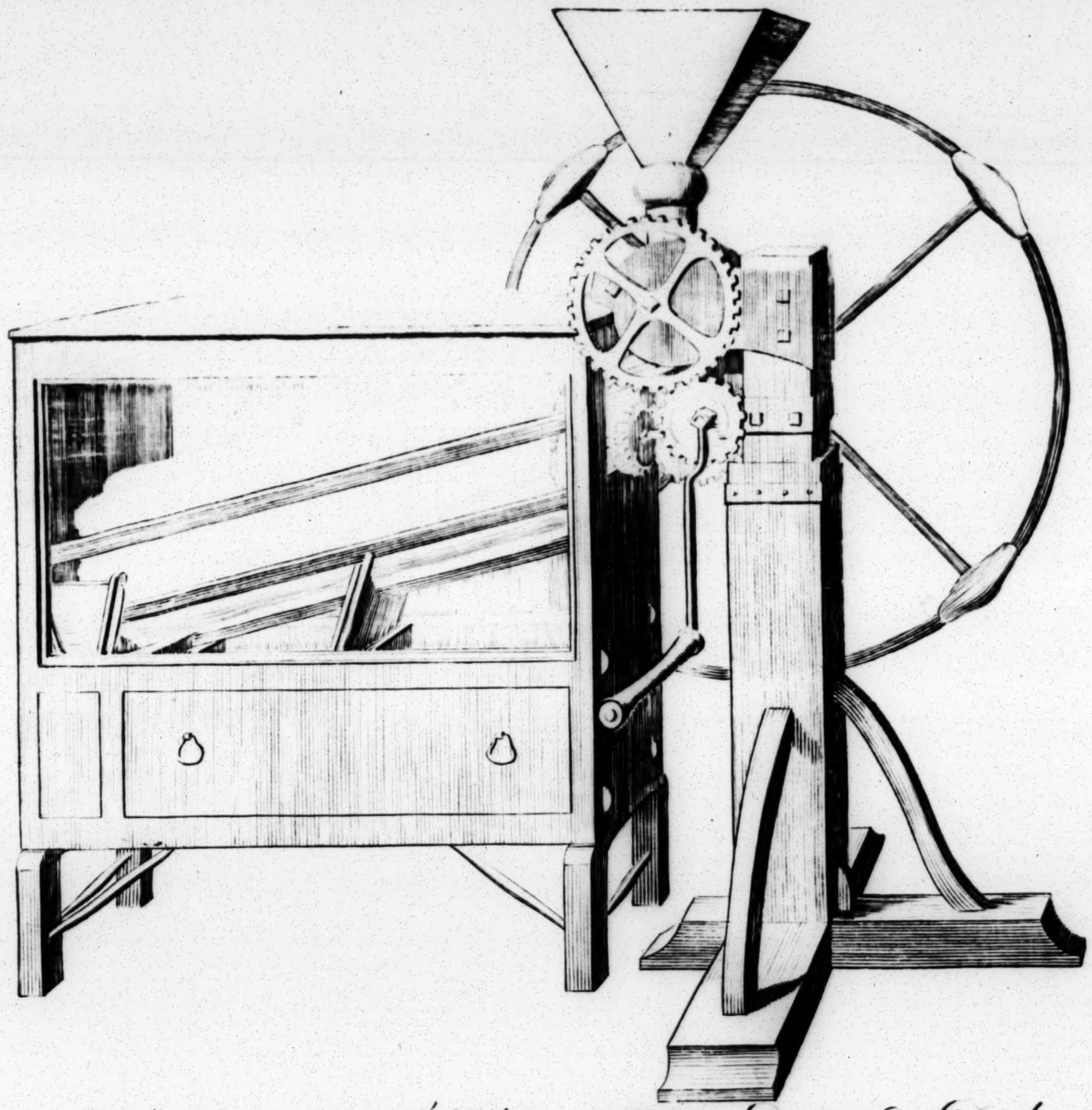
This Machine is very proper for cleaning or airing Corn in Graineries or Ships, is very expeditious, and the Strength of a Boy ſufficient to turn it.



Hand Mill for Splitting of Beans,
Grinding Malt, Barley, Oats &c.

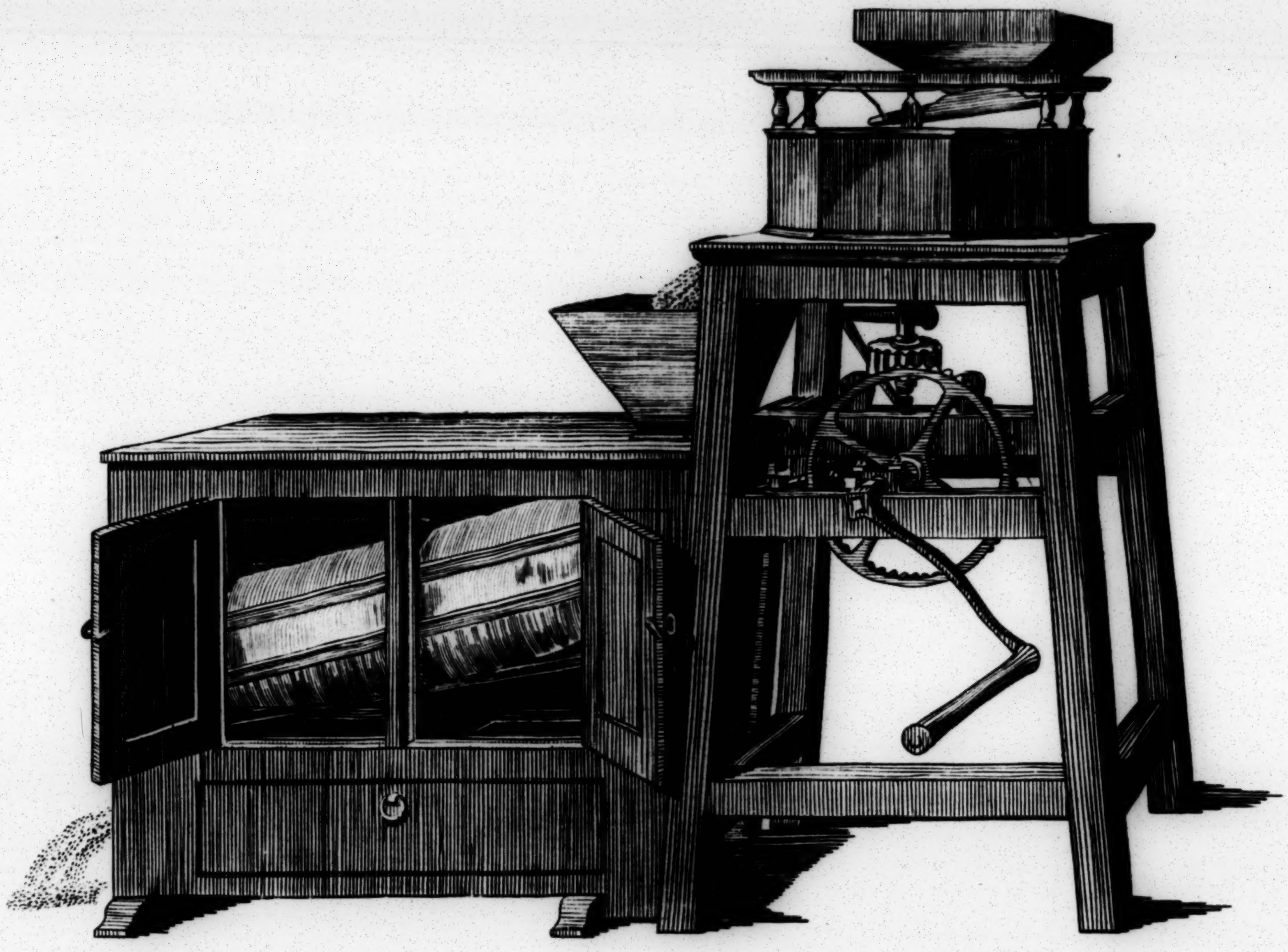
Made & Sold by James Sharp London

Miles ſculpt. Borough



A Steel Corn Mill with Belting Mill annex'd to Grind & Dreſs two sorts of Flower & Bran at the same time.

Miller sculp



A Quernstone Mill with Bolting Mill annex'd, to Grind and dreſs two sorts of Flower, and Bran, at the same time

Made & Sold by James Sharp London

REFERENCE to the HAND-MILLS.

The Mill for ſplitting Beans, or grinding Malt, Barley, Oats, &c.

CONSISTS of a Steel notched Bar and Roller, regulated by Back Screws, ſo contrived as to make it fit for the Admiſſion of the largeſt Bean or the ſmalleſt Grain.

The Feed is regulated by a Wooden Slider within the Hopper, as appears by the Print, and the Box underneath draws out for the more convenient emptying of it.

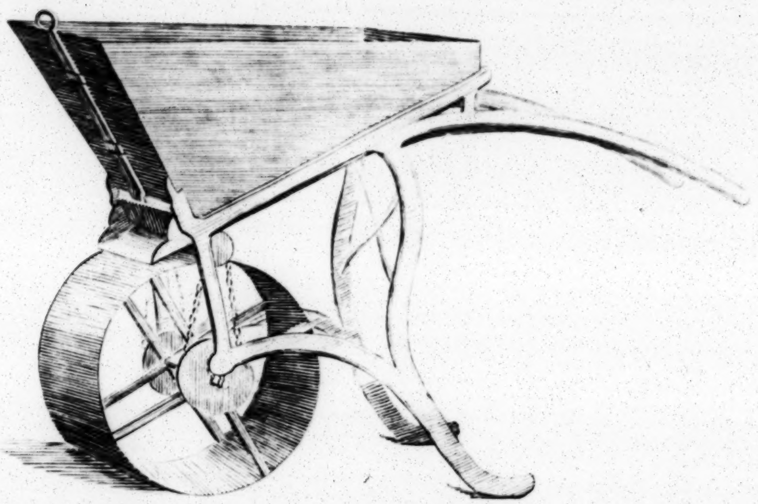
It is an excellent Malt-Mill, and very uſeful for grinding Barley for Dogs; it is exceedingly expeditious, and requires very little Labour.

The Steel Corn-Mill, with Bolting-Mill annexed,

Is a very complete Machine for grinding Wheat or Indian Corn, and is an Improvement on the Steel Mills, being cut with round Teeth, ſo as to break the Corn and flake the Bran, which it is capable of doing by the Power of the additional Cog-Wheel; ſo that the Corn being bruiſed, and not cut, (which it generally is in every other Kind of Steel Mills,) produces both its Flour and Bran as perfect as if ground by Stones, and it is worked with very little Labour.

The Quern-Stone Mill, with Bolting-Mill annexed,

Anſwers the ſame Purpoſes as the former, and is a moſt complete Machine when the Feed is properly regulated, though it requires rather more Labour, but is more expeditious than the Steel Mill.



A Wheel barrow for scattering Sand or Gravel, on Garden Walks, or for manuring with Lime.

Made & Sold by James Sharp London

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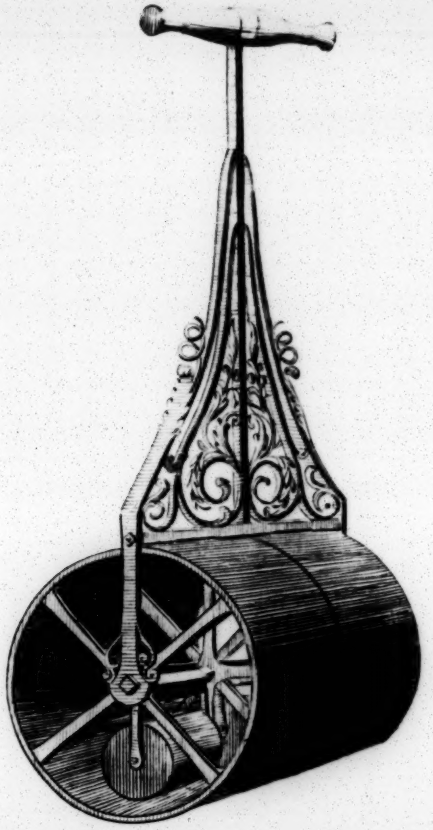
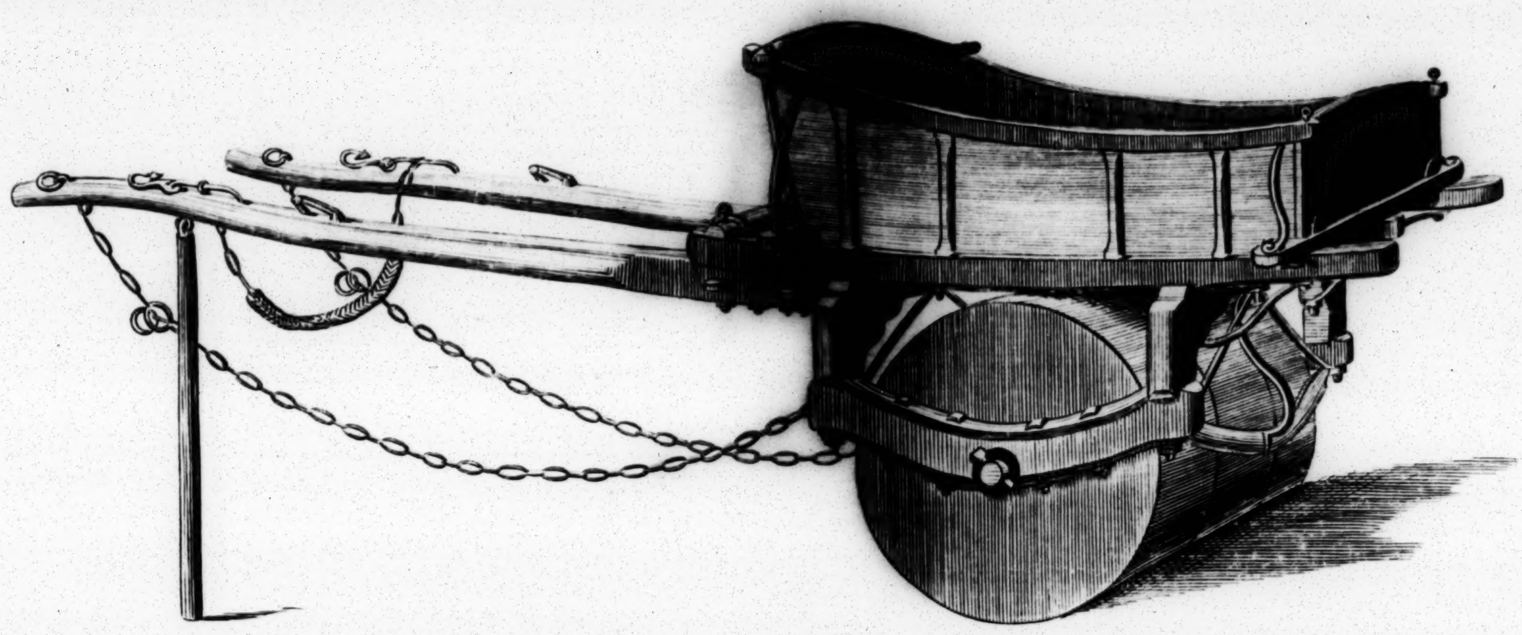


A Divided Garden Roller
with Ballances

Made &c. Sold by James Sharp London [illegible]



A Cart-Roller with light wheels in three Divisions for easy Turning

Made & Sold by James Sharp London

Miles sculpt. Borough

ROLLING CARTS & WAGGONS,
for the Amendment & Preſervation
OF ROADS.

as they are now built by
JAMES SHARP,
of Leadenhall Street London,
1773.

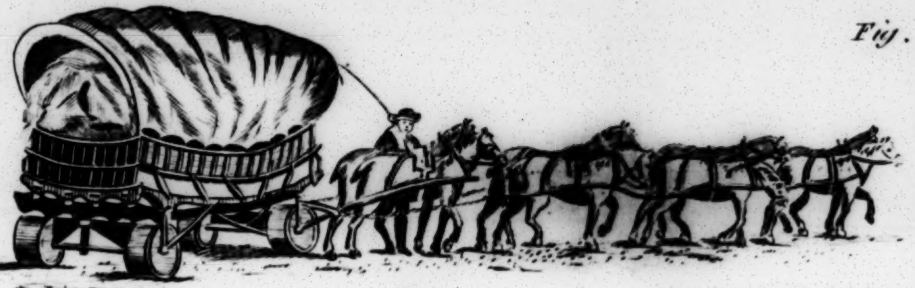


Fig. 5.

Fig. 1. Plan of the Waggon.
2. The Profile of the Waggon.
3. The Tail of the Waggon with Scrapers.
4. The Tail of the Cart with Scrapers.
5. A View of the Waggon with 8 horses.
6. The Profile of the Cart.
7. The Tail of the Cart.
8. A View of the Cart with 2 Oxen in harneſs.
9. A View of the Cart with 4 Oxen in harneſs.

Fig. 10. A Pair of Wheels fitted into an Iron frame so as to form a Garden Roller to be drawn by a Man & when hook'd to the tail of the Cart at Fig. 7 forms a compleat Roller for Land to be drawn by Cattle, & are also a pair of spare Wheels for a Cart or Waggon.

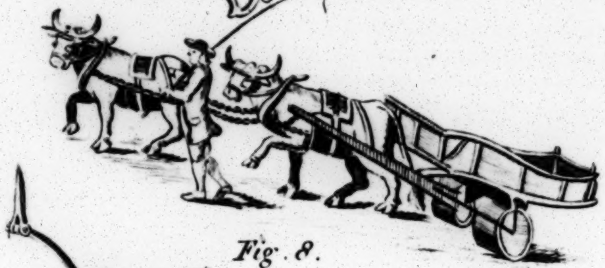


Fig. 8.

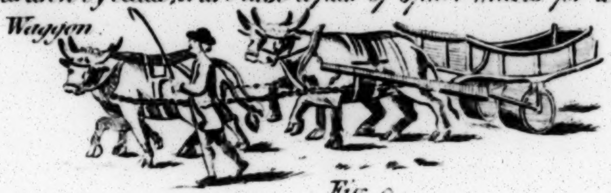


Fig. 9.

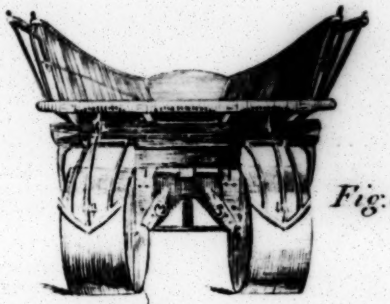


Fig. 3.

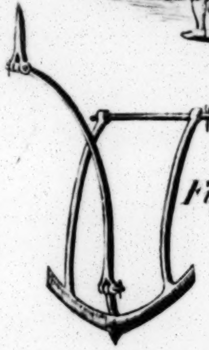


Fig. 11. Scraper for Clay Roads Snow & Ice, ½ Inch scale.

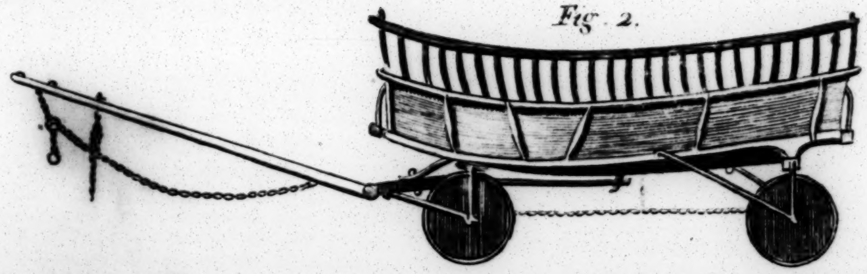


Fig. 2.

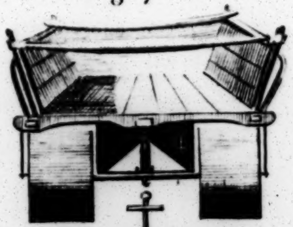


Fig. 7.

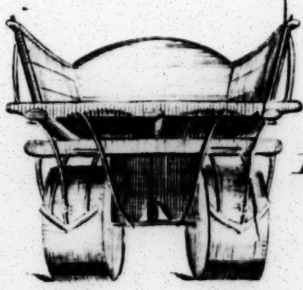


Fig. 4.

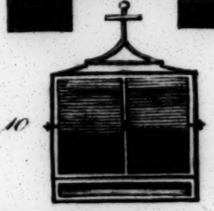


Fig. 10

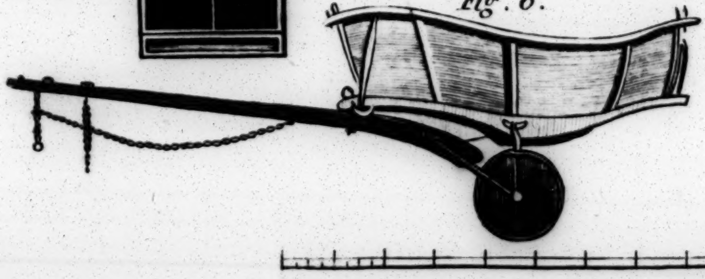


Fig. 6.

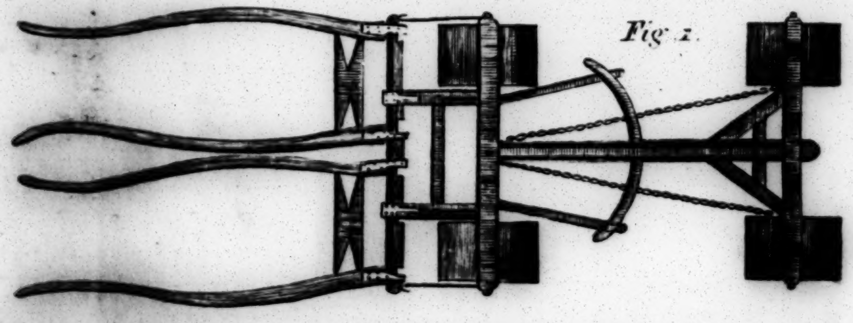
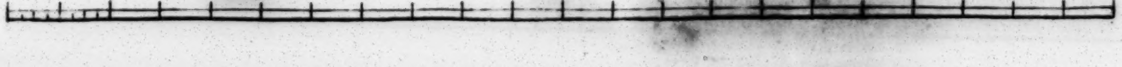


Fig. 1.



Reference to the ROLLING CARTS, WAGGONS, and CART ROLLERS.

BY an Act *for the Amendment and Preſervation of the public Highways*, "All Carriages, moving "upon Rollers of the Breadth of Sixteen Inches, "are allowed to be drawn with any Number of "Horſes, or other Cattle."—And

"By an Act *for regulating the Turnpike Roads*, "ſuch Waggons are allowed to carry Eight Tons "in Summer, and Seven Tons in Winter, and may "be drawn with any Number of Horſes or other "Cattle."

They are alſo permitted "to paſs upon any Turn-"pike Road TOLL-FREE for the Term of FIVE "YEARS to be computed from *Michaelmas*, 1774; "and, after the Expiration of the ſaid Term, ſhall "paſs upon any Turnpike Road, through any Toll-"gate or Bar, upon paying *only one Half of the Toll* "payable for Carriages having the Fellies of the "Wheels ſix Inches or upwards."

Both Carts and Waggons, upon this Conſtruction, are found by Experience to anſwer every Purpoſe that can be deſired, even in the very worſt of Roads; they are both cheaper and much lighter than common Nine Inch Broad Wheels; they are more durable, and ſure to produce a ſmooth Road; and, when they have paſſed often enough to ſmooth the Road, the Cattle are able to draw much heavier Loads than upon other Carriages.

The Rollers are placed under the Body of the Cart or Waggon, and run abreaſt or parallel with each other: They are true Cylinders of caſt or wrought Iron, ſixteen Inches broad, perfectly flat, without Nails, or other Projection, to injure the Face of the Road, and are made from two to three Feet high, according to the Deſire of the Uſer. The Inſides are filled up with ſtrong Plank, ſo as to appear, and have the Strength of, a ſolid Roller, and yet are hollow, in the Manner of a Caſk.

Upon a *ſmooth* and *hard* Surface they are drawn as eaſily as narrow Wheels, and it cannot be doubted but the frequent Uſe of them will render the Roads both *ſmooth and hard*.

The Roughneſs or Inequality of Roads, occaſioned by Wheels too narrow, or broad ones not made flat, cauſes greater Reſiſtance to the Cattle than Friction upon the Axle-Trees, and even this Article of Friction is conſiderably leſs in theſe Rollers than upon the Axis of Wheels in the common Way; for it may be demonſtrated, that, upon the Generality of Roads, theſe Rollers have leſs Friction upon the Axis than Wheels in the common Way.

A Compariſon of the Advantages and Diſadvantages of High and Low Wheels.

SOME Perſons having objected to the Rolling Carts and Waggons on Account of *the Lowneſs* of the Wheels, it is neceſſary to conſider how far the

the Objection is juſt, becauſe a Compariſon of the Advantages and Diſadvantages of *high* and *low* Wheels will demonſtrate that *the Lowneſs* of the Rollers is a very great Advantage to Carriages of this Kind.

It is allowed that there are two Advantages in *high* Wheels, when applied to Carriages which are to be drawn, *viz.* their being Levers leſſening Friction upon the Center, while they ſtand perpendicular; and their having a larger Circumference.

But theſe Advantages are much overbalanced by other Inconveniencies, and it may be eaſily proved, that loaded Carriages with *low* Wheels will be drawn with greater Eaſe to the Cattle for the following Reaſons.

Becauſe the great Increaſe of Weight* in *large* Wheels, when applied to heavy Carriages, is of itſelf prodigious, and muſt always be conſidered as a Part of the Load.

Becauſe alſo *high Wheels*, though Levers *leſſening Friction* upon the *Center*, when they ſtand perpendicular, are alſo Levers *increaſing Friction* by lateral Preſſure, whenever the Carriage paſſes upon uneven Ground. And laſtly,

Becauſe *high* Wheels require greater Force to paſs them over the uſual Obſtacles of the Road; the Force of the Animal being then applied in an horizontal Direction, ſo that great Part of it is loſt in preſſing againſt the Obſtacle.

Theſe Circumſtances conſidered, the Balance will be found in Favour of *low* Wheels.

Firſt, Becauſe they are both lighter and ſtronger.

Secondly, Becauſe, in general, they have *leſs* Friction.

Thirdly, Becauſe *leſs* Force is required to ſurmount the uſual Obſtacles of the Road, the *elevating* Draft being more nearly *parallel to the Line of Aſcent*.

Fourthly, Becauſe the Animal can really apply more Strength to the *low* than *high* Wheel; for, the Force to the *low* Wheel being applied by Elevation, the Ground ſerves as an Abutment to the Feet of the Animal, which gives him Power to uſe his Strength in the moſt proper Direction, whereas, horizontally, from a *high* Wheel, he has no Power of Draft but what is given by his Weight.

If, therefore, *high* Wheels could be uſed without being *heavier*, or without being Levers *increaſing Friction* by lateral Preſſure, or without incurring an *improper* or *indirect* Application of Force, or if they could be uſed *without diminiſhing the Power of the Animal*, they would be then moſt advantageous; but, till then, *low* Wheels will be found moſt beneficial.

Mr.

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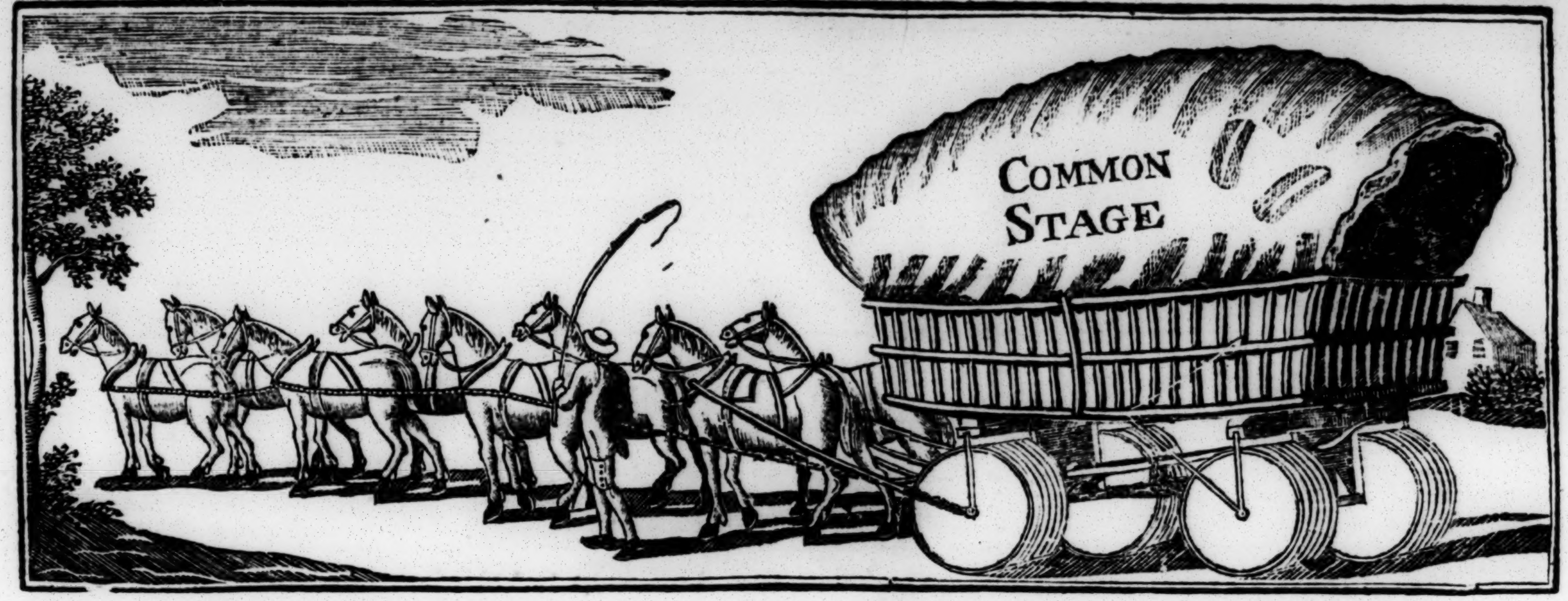
* *Note*, A Set of nine-inch Broad Wheels, made in the uſual Way for Stage Waggons, are generally about thirty Hundred Weight, and ſome have been made ſo heavy as forty. Whereas a Set of Rollers, complete for a Rolling Waggon, ſeldom weigh above Ten Hundred, ſo that about a Ton will be ſaved in the Weight of Wheels only.



General Directions for the Driver of the Rolling-Waggon.

LET the Waggon be greaſed as often as you conveniently can whilſt it is new.

Be careful that you put on again all the Rings, or Waſhers, to their proper Places; examine the Boxes often, (leſt they ſhould get looſe at firſt,) and wedge them up tight.

Hook up the Backbands of the Thiller-Horſes very ſhort, that the Cattle may draw upwards as much as poſſible; and let the Body-Horſes (or the Pair next the Thillers) have Pads or Saddles on their Backs, to ſuſtain the Preſſure occaſioned by the Leaders.

Load the Waggon heavy before, and leave the hind Part as light as poſſible.

Theſe Precautions obſerved, every Owner will find his Account in ſuch Carriages from the very firſt; for no Road or Country can prevent their being uſed with Advantage.

N. B. When Horſes draw horizontally, they cannot exert their natural Strength, for Want of Abutment, having no more Power than what their Weight enables them to uſe; but, if the Line of Draft is ſuffered to deſcend from the Backband of the Horſe to the Center of he fore Wheel, then the Animal will gain Ability to uſe his Strength, and this in Proportion as the Size of the Wheel is diminiſhed: The Thill and Body Horſes, by this Mode of acquiring Abutment, will have the moſt Power, whilſt the Leaders, by drawing horizontally, have no Power beyond the Proportion of their Weight; but the Force of the whole Team together, with Reſpect to the Waggon, will be applied by Elevation, the Body-Horſes bearing the Preſſure of the Leaders, which, by Experience, is not more than they can eaſily ſupport; and which, beſides, will be a material Advantage to them, by giving them more Power than they could otherwiſe obtain without it. See the Print above.

Mr. *Sharp* is prepared to demonſtrate the Facts above-mentioned, either by Experiment, or by the Carriages themſelves, to thoſe who may think it worth their while to enquire about them.

A Defence of this Theory may be ſeen in the Gentleman's Magazine for *November*, 1773.

The foregoing Arguments are ſtrictly true, with Reſpect to every Two-wheeled Carriage, becauſe the Line of Draft in them commences at the Back-band or Point of Bearing, and paſſes immediately from thence to the Center of the Wheel; nor can their Line of Elevation ever be interrupted by any miſplacing of Shafts or Pole, therefore full Power of Elevation will always be preſerved if the Wheels are low.

But, in a Waggon or Four-wheeled Carriage, it is not entirely ſo; *the Front Wheels only* can receive Elevation from the Cattle, and even *they* will loſe the Advantage of elevated Draft, if the Splinter Bar is raiſed higher than the direct Line from the Back-band to the Center of the Front Wheels; but the hindermoſt Wheels, being drawn horizontally, can receive no Elevation. For theſe Reaſons I recommend the Wheels of Waggons to be three Feet high; and it is found, by long Experience, that the Height of three Feet is ſufficient to anſwer every Purpoſe required, and that, if higher than three Feet, they would be ſubject to other Inconveniencies more than adequate to any Advantage that could be gained by their being higher.

Advertiſement.

BY a late Addition of Triangular Scrapers, for cutting the Dirt in *ſtiff Clay Roads*, they are alſo rendered the moſt complete and uſeful Carriage that can be uſed in *Froſt* and *Snow*.

To aſcertain the Advantages of theſe Waggons, they were employed early in the Year 1772, in carrying Underwood and Timber, amidſt a Multitude of narrow-wheeled Waggons, in a Part of *Northamptonſhire*, which, at that Time, was remarkable for the very worſt Roads, both Private and Turnpike, perhaps in the Kingdom; and it was found, that, when the narrow Wheels could paſs no longer, the Rolling Waggons ſtill continued paſſing, with larger Loads than the narrow Wheels uſually carried; and I have frequently ſeen them paſs over Sloughs with great Eaſe, in which narrow-wheeled Waggons have been mired and laid faſt, till drawn out by a great Number of additional Horſes.

In the latter End of the ſame Year, my Rolling Waggons made about Thirty Journies to *Bedford*; and during the Winter they made about One Hundred and Twenty Journies, to and from *Whittlebury Foreſt* and *Northampton*, with ſuch heavy Loads of Timber and Coals, that ſome People ſuppoſed the Roads would have been deſtroyed by ſuch conſtant Carriage in wet Weather, (it not being uſual in this Country to carry Timber in Winter Months;) but the contrary Effect was remarkably produced by by them, for the Road, inſtead of being injured, was apparently improved; the Paths formed by the Rollers, both in private and Turnpike Roads, were ſo even and flat, as to make an excellent Paſſage for Horſes abreaſt, or any Kind of quartering Carriages, and were ſo ſmooth and clean, that even Foot Paſſengers preferred them to walking in the Fields.

Since that Time frequent Journies have been made with the uſual Loads (viz. about Four Tons) to the moſt diſtant Parts of the Kingdom; and this in the uſual Number of Days, and with the uſual Loading, and through the moſt hilly Countries; ſo that there remains no Doubt of the Advantage to the Uſers. The Effect to the Public, by the Improvement of Roads, muſt be obvious to every Perſon who ſees them; and there is no Doubt, but, as common Prejudice, againſt every Thing that is new, wears off, Rollers will become the common Carriage of this Country; eſpecially as they are cheaper, when applied to Carts, than common broad Wheels, and the many Letters received from the Uſers of them, in different Parts of England, will fully juſtify this Idea.

The SINGLE-SHAFTED CART, with Rollers Two Feet high, and wrought Iron Tire and Scrapers, are the beſt Carriage that can be uſed for the common Purpoſes of Farmers.

The DOUBLE-SHAFTED CARTS are the moſt proper for the Uſe of Gentlemen, becauſe the Roller follows the Feet of the Horſes, and prevents Injury to the Turf upon which they are drawn; they are alſo the beſt adapted to very bad Roads, becauſe they quarter over the deep Ruts and Ridges made by narrow Wheels, and they both make and preſerve an excellent Track for Coaches or Poſt-Chaiſes*.

Both the SINGLE AND DOUBLE SHAFTED CARTS are cheaper than common broad-wheeled Carts, with Iron Axle-Trees, to which they muſt always be compared, being larger and better ſuited to very heavy Loads.

TUMBRIL CARTS, WITH NINE-INCH WHEELS, from Eighteen Inches to Two Feet high, are executed upon this Plan, with Scrapers, and is the moſt uſeful Carriage for removing Earth, &c. with a ſingle Horſe.

Any of the above may be converted into Land Rollers, by fixing a Pair of divided Rollers, as at *Fig.* 10. at the Tail of the Cart, by which Means the whole Surface is covered by Rollers.

The CART ROLLERS are different from ROLLING CARTS: though they are capable of carrying heavy Burthens like Carts, and yet are light in themſelves, but they are neither ſo ſtrong, nor can they be drawn ſo eaſily as ROLLING CARTS, nevertheleſs they are excellent for the particular Purpoſes of Garden Cart, or Land Roller, &c. and may be uſed for Light Rolling when the Ground is *ſoft*, or, by Loading, be made as heavy as the Uſer pleaſes when the Ground is *hard*.

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* My Waggons have frequently been ſent with a heavy Load through bad Roads, when a Quarter has been wanted for Poſt-Chaiſes, which has made it trotting Road for a Month or Six Weeks to come.

A Liſt of ſome other Articles that are uſually made, and may be ſeen at Mr. SHARP's Manufactory in TOOLEY-STREET.

ANCHORS of every Size, from a Half Hundred Weight, to 40, 50, or 60, Cwt.

Grapnals and Creepers of every Size.

A Ship's Windlaſs, of a particular Conſtruction (by Capt. *Stephen Wright*, of *North Shields*:) It ſtops the Cable at every Inch, is perfectly ſafe, has been ſo much approved of that many Hundreds of them have been made. They are much uſed in the Coal Trade. See B in the firſt Plate.

Iron Axle-trees, or Screw-bolted Arms for every Sort of Carriage.

Gudgeons, Caſes and Braſſes, Steps, Cappooſes, Screws-Bolts, Hoops, and every other Sort of wrought or caſt Iron Work, truly turned, for Sugar Mills.

Several particular Patterns of Iron Windmill Shafts for reducing Friction, with Iron Croſſes for the Fanns, &c. which have been much approved; alſo Timber Work, if required, fitted to every Part of the Mill.

Beſides the ſeveral Kinds of Rolling Carriages mentioned in the Prints, every Sort of Wains, Waggons, Carts, &c. either broad or narrow wheeled, for Weſt-India Planters Uſe, are made, as well as Trucks, particularly conſtructed, for Sugar Hogſheads.

Several Sorts of Street or Porter Trucks.

Several Sorts of Rolling Trucks for Warehouſes.

Several Sorts of Tumbril Carts for one or two Horſes, from 9 to 12 Inch broad Wheels.

Bottle Carts, Fiſh Carts, Baggage Carts, or Caravans, on Springs or Braces.

Several Sorts of Cart-Rollers, from 18 Inches to 3 Feet high, truly turned and divided, from 1 Foot to 7 Feet broad.

Caſt Iron Rollers, truly turned and divided, of any Size or Dimenſions whatever, to be drawn by Men or Horſes.

Every Sort of Rolling Carriage, together with Rollers adapted to hang behind Carts, &c. for Graſs Rolling.

Divided Garden Rollers and Cart Rollers for Land. See the ſeveral Prints.

Theſe are divided into ſeveral Parts, for the Purpoſes of ſhort and eaſy turning: for in ſhort Turns every ſeparate Diviſion moves upon its Axis, agreeable to the Ground underneath it, without ſliding, or ſcraping, whereby every Kind of Friction or ſcrewing up the Ground is prevented, and the Rollers are moved with very little Force. The Spindles of theſe Rollers being firſt turned in the Lathe, and the Cylinders afterwards turned in the Mill upon their own Spindles, the whole Machine is thereby rendered mathematically true.

Ploughs of every Kind.

Hartfordſhire.
Cambridge.
Welch.
Dutch. Rotherham.
Somerſetſhire, with one Wheel or Stump.

Trenching Plough, by Ducket.
Foot Ploughs, made entirely of Ir[illegible]
Carriage Ploughs, entirely of Iron.
Arbuthnot's Draining Plough, improv[illegible] Rack and Pinion. See the Plate.

The Coulter Share and Wings in this Plough are exactly the ſame as in Mr. Arbuthnot's, except that as his Plough, by its Manner of opening, can only be uſed at its narroweſt or broadeſt Pitch, this, by the Addition of the Racks and Pinions, and by reverſing the Handles, may be fixed at any intermediate Space, ſo as to cut a Drain, either broad or narrow, or of any Width between either. See the Print.

Kentiſh or Turn-Wriſt Plough. See the Plate.
Improvement on ditto by Rack and Pinion.

The common Kentiſh Plough is uſed for going either backwards or forwards, and ploughing always upon the ſame Side of the Land, always turning the Earth the ſame Way, (ſee the Print;) but this requires much Trouble, for at every Turn the Coulter muſt be moved by the horizontal Lever at Top, and the Ploughman muſt ſtoop down to unhang the lower Ba or Mould Board, and muſt ſtoop down again to fix it on the oppoſite Side; whereas in the improved Plough (ſee the Plate with Rack and Pinion) the Handle at C moves both the Coulter and the Share at A and the Wings at B, ſo as to make them take more or leſs Hold of the Land, and, by reverſing the Handle into the Hole D, it will be fixed to whatever Pitch the Uſer thinks proper.

Drill Ploughs of ſeveral Sorts.
Horſe-Hoes, ditto
Horſe-Hoe, by Hewit.
Drill Plough, by Ducket, for Broad-caſt Sowing.

Man-Hoe, by Ducket, to be drawn by Men, and fitted to the Broad-caſt Plough. See the firſt Plate N.

Mr. Ducket's Plough, which is drawn by Horſe, is ſo contrived as to make Five Furrows at each paſſing over the Land, the Seed is then to be thrown by Hand, in the common Way, which will generally fall into the Furrows, and the Plants will riſe in regular Lines: after which the Man-Hoe is to be uſed for weeding, which has Five Shares, exactly ſuited to the Diſtance of the Lines formed by the Plough, and Harneſs fitted for a Man to draw by, who walks backwards, having his Eye upon the Shares, ſo that he cleans five Lines at a Time, without Fear of injuring the Plants. See the firſt Plate M.

Harrow Plough with Wheels. See the firſt Plate P.
Horſe Shovels for Ant-Hills.

Theſe Shovels conſiſt of a ſtout Iron-Bar, about Three Feet long, having a broad pointed

Shovel in the Middle, to the two Ends of which Bar the Traces of the Horſe are fixed; and, two long wooden Handles being fixed behind, the Uſer has full Power, when the Horſe moves forward, to direct it deep into the Ground, and to throw it out again when he pleaſes; ſo that, in the Spot where the Ant-Hill ſtood, a ſmall Receſs is formed for the Water to lodge, which effectually deſtroys the Ants.

Horſe Shovels for removing Earth to ſhort Diſtances, and for levelling uneven Ground.

Theſe are, in Appearance, like a very large Wheel-barrow, but without any Bottom; when it is drawn forward by the Horſe, the Wheel before prevents its dipping too deep or tilting over; and, when the Man behind preſſes upon the Handles, it will inſtantly load itſelf, and may then be drawn wherever it is wanted; the Man behind then lifting upwards, it will diſcharge its Contents without any other Trouble. This Shovel is an excellent Accompaniment to the Ant-hill Shovel, for by it the Ant-hills may be collected into Heaps for burning, with very little Labour or Trouble.

They are alſo exceedingly uſeful in Road-making, where higher Grounds are to be cut to fill up lower; the high Ground, being firſt broken up with a plough, is eaſily brought down by this Shovel, and with great Expedition. See the Plate in Explanation.

Navigation Wheelbarrows.—Brindley's Pattern.

Machi [illegible] Turnips, by the ingenious
Mr. *Ja* [illegible] for which he obtained a
“ Pre [illegible] y Pounds, *Dec.* 10, 1766,
“ from [illegible] Arts.” They are ſo contrived as to c [illegible] into even Slices, as thin as an Eighth [illegible] from thence as much thicker as the Uſer pleaſes.

Accurate Engravings of this Machine may be ſeen in Mr. *William Bayley's* Deſcriptions of uſeful Machines, *&c.* in the Repoſitory of the Society of Arts, *Plates* XVI, XVII, and XVIII.

“ There are ſome Improvements made to it by
“ Mr. *William Bailey*, for which the Society gave
“ him a Bounty of Ten Guineas, *Mar.* 11, 1767.

“ *N.B.* Two Men can work this Machine with
“ ſo much Eaſe and Facility, as to ſlice Twelve
“ Buſhel of Turnips in Five Minutes; which Ope-
“ ration I did perform in Preſence of the Committee
“ of Agriculture, at the Time abovementioned.”
See the firſt Plate D.

Scattering Barrows, ſeveral Kinds. See the Print.

Caſting, Ditching, Navigation, and Garden, Spades.

Ballaſt Spoons, Nets and Drag Scoops.

Hand Cranes of ſeveral Patterns.

Screw Jacks, double and ſingle, and of ſeveral Sizes.

Screw Jacks, a particular Pattern, for Carriages.

Iron Blocks with Braſs Sheaves, ſeveral Kinds.

Combination ditto, by Smeaton.

Theſe Blocks have two Tier of Pullies in each Block, ſo that the Fall comes down from the Middle Sheave to the Hand, whereby the Strain is even, and gives prodigious Power.

Spatch Blocks for different Uſes.

Cocoa Hooks and Cotton Rollers for Weſt-Indies.

Bear, Fox, and Garden Traps, ſeveral Sorts.

Blaſting Tools, in Sets, for Mines, Quarries, &c.

Boring Tools for Earth Boring.

These are made with Variety of Bits, each of which fix into ſtrong Shanks, and by Screw Joints are extended to any Length; ſome have been made for Coal-boring as long as Six Hundred Feet. The uſual Bits are an Auger Spoon for Earth, a Worm Bit, for Gravel, a Jumper, or Chiſſel Bit, for Rock, and a Cloſe Auger for bringing up the Contents.

Iron Preſs-Screws, of any Diameter, cut out of the Solid, after being turned in the Lathe.

Iron Cheſts, Bookcaſes, and Iron Safes, of every Sort.

Penſilvanian Stove-Grates, of ſeveral Kinds and Patterns, with Mr. Sharp's Improvements, for warming Rooms, Halls, or Churches, by a continual Introduction and Exchange of dry freſh Air. See a fuller Account of them, with Copper Plates, already publiſhed.

Stoves *for the Introduction of warmed Air*, upon the Principle of an inverted Syphon, ſuch as are erected in the Foundling Hoſpital, Bank, &c.

Fire Engines to a particular Pattern.

Forcing Pumps.

Square ditto and Boxes, made from Plank.

Shanks and Bits for Pump Boring.

Ship Work, Iron Railing, &c.

Together with ſeveral other uſeful Things in rough Mechaniſm.

N.B. Horſes are conſtantly ready, at the Manufactory, to ſhew the Effects of the ſeveral Rakes, Ploughs, Shovels, &c. or to draw the different Sorts of Carts, Waggons, or Rollers, whereby Judgement may be formed of the Utility of each Machine. The loweſt Price is fixed upon each Article, and Payment will be expected on Delivery of the Goods.

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UTENSILS in HUSBANDRY,
PLOUGHS,
HARROWS,
CARRI[illegible]GES,
ROL[illegible]ERS,
EN[illegible]INES,
MI[illegible]L-WORK, &c.